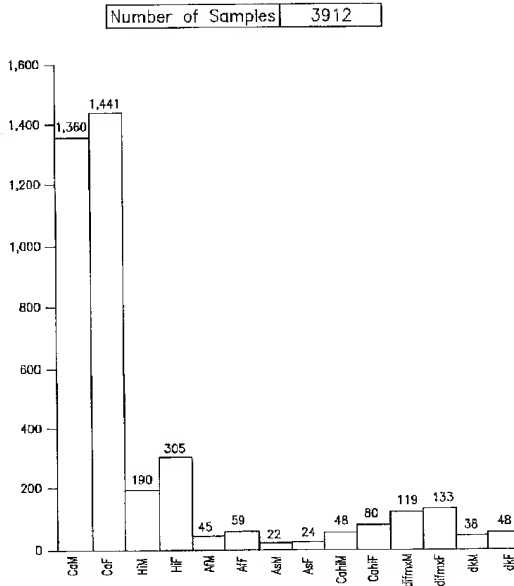




US 20030190644A1

(19) **United States**(12) **Patent Application Publication**
Braun et al.(10) **Pub. No.: US 2003/0190644 A1**(43) **Pub. Date: Oct. 9, 2003**(54) **METHODS FOR GENERATING DATABASES
AND DATABASES FOR IDENTIFYING
POLYMORPHIC GENETIC MARKERS**(76) Inventors: **Andreas Braun, San Diego, CA (US);
Yip Ping, San Diego, CA (US)**Correspondence Address:
**Stephanie Seidman
Heller Ehrman White & McAuliffe LLP
7th Floor
4350 La Jolla Village Drive
San Diego, CA 92122 (US)**(21) Appl. No.: **10/272,756**(22) Filed: **Oct. 15, 2002****Related U.S. Application Data**(60) Division of application No. 09/687,483, filed on Oct.
13, 2000.
Continuation-in-part of application No. 09/663,968,
filed on Sep. 19, 2000.(60) Provisional application No. 60/217,658, filed on Jul.
10, 2000. Provisional application No. 60/159,176,
filed on Oct. 13, 1999. Provisional application No.
60/217,251, filed on Jul. 10, 2000.**Publication Classification**(51) **Int. Cl.⁷ C12Q 1/68; G06F 19/00;
G01N 33/48; G01N 33/50**(52) **U.S. Cl. 435/6; 702/20**(57) **ABSTRACT**

A high throughput method of determining frequencies of genetic variations is provided. The method includes steps of selecting a healthy target population and a genetic variation to be assessed; pooling a plurality of samples of biopolymers obtained from members of the population; determining or detecting the biopolymer that comprises the variation by mass spectrometry; obtaining a mass spectrum or a digital representation thereof; and determining the frequency of the variation in the population.

DNA Bank

DNA Bank

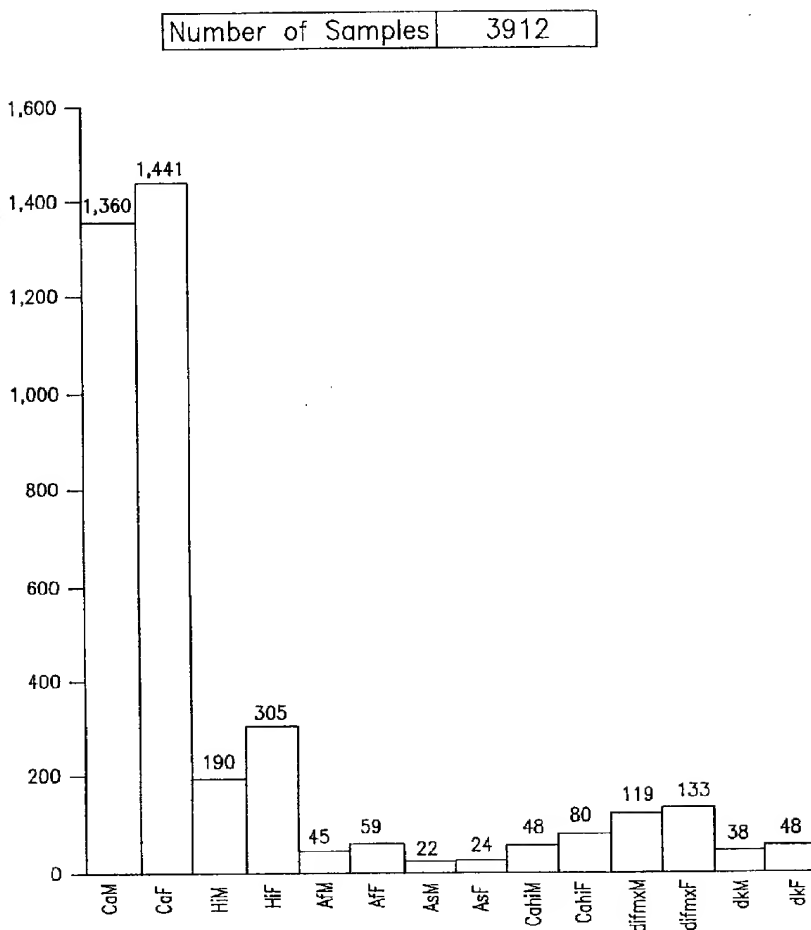


FIG. 1A

Caucasians

Number of Samples	2801
-------------------	------

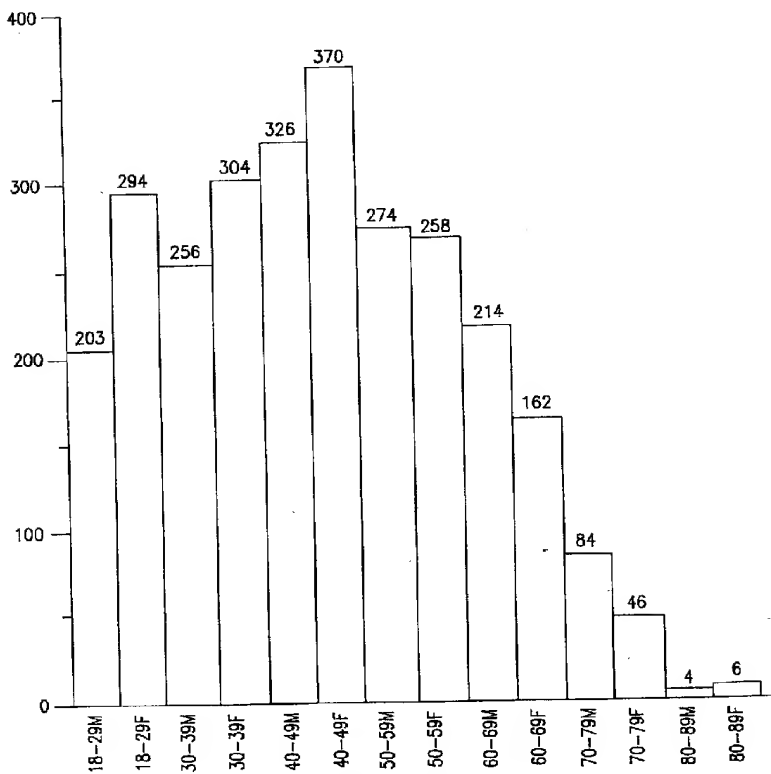


FIG. 1B

Number of Samples	495
-------------------	-----

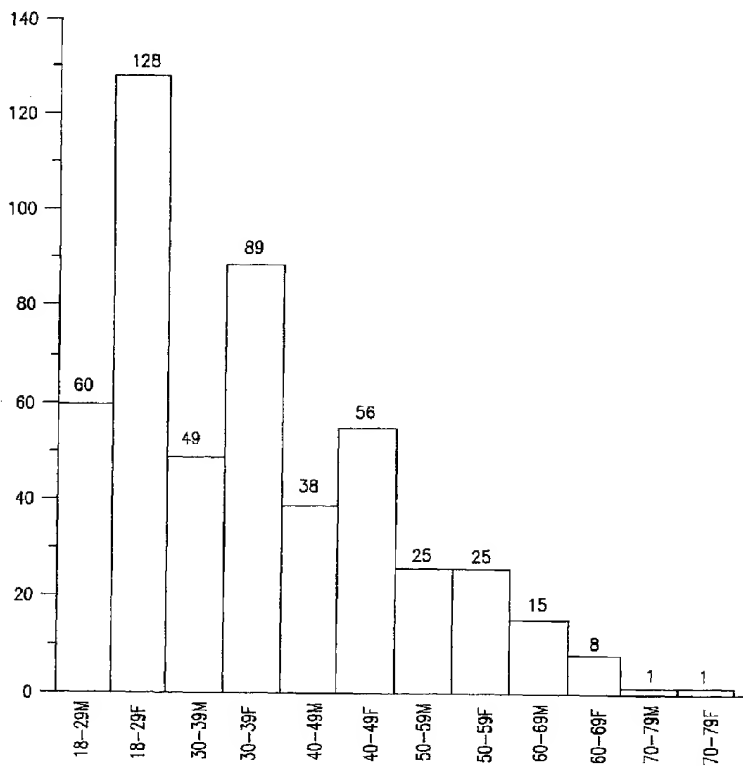
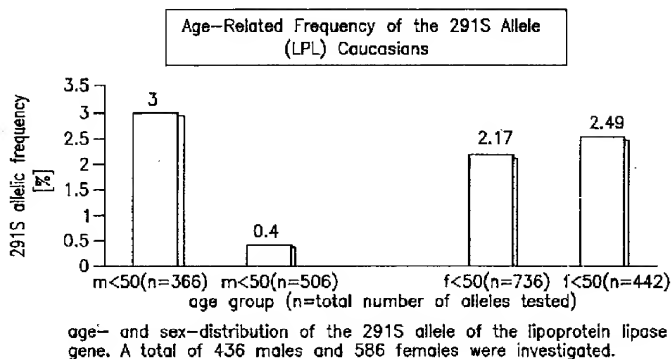
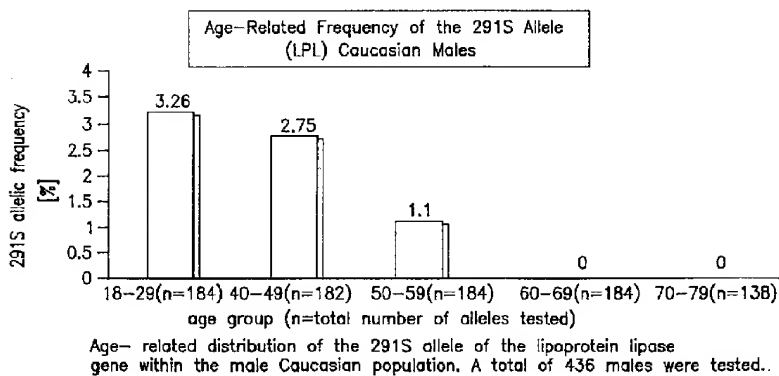


FIG. 1C

**FIG. 2A****FIG. 2B**

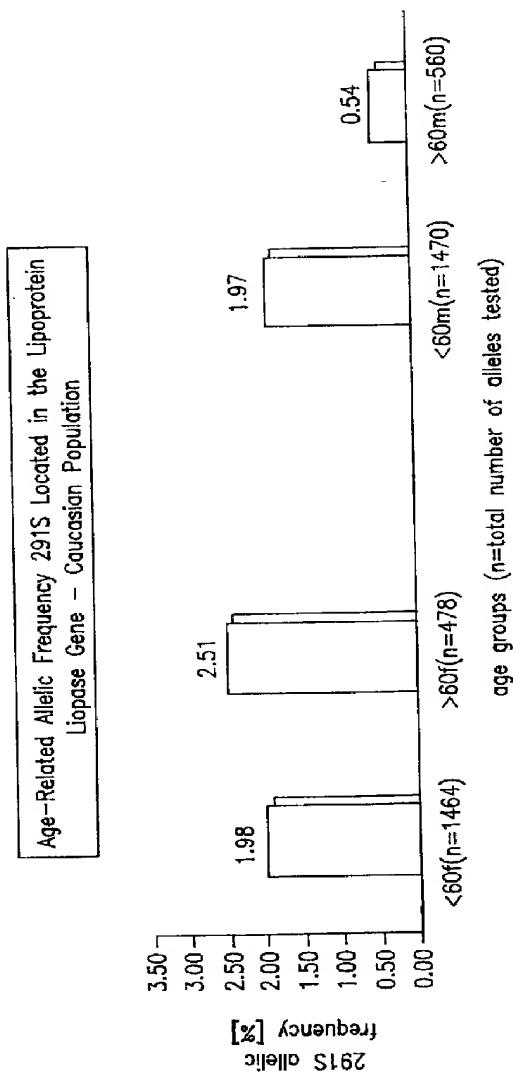


FIG. 2C

Questionnaire for
Population-Based
Sample Banking

Data Collection Form

Collection Information

Consent Form Signed Yes No

Date of Collection (MM/DD/YY) ____/____/98

Time of Sample Collection (nearest hour in 24 hour clock format) _____

Initials of Data Collector _____ Collecting Agency _____

(DO NOT COMPLETE: (For Date Entry Only) Sample _____ intact _____ lost _____ broken

Affix Barcode Here

Donor information

Sex: ☐ Male ☐ Female

Date of Birth (MM/YY) ____/____

In which state do you live? _____ How long have you lived there? _____ Years

What is your highest grade you completed in school?

☐ less than 8th grade ☐ 8th, 9th, 10th or 11th grade ☐ high school graduate or equivalency☐ some college 2 yr degree ☐ college graduate 4 yr degree ☐ post graduate education or degree

To the best of your knowledge what is the Ethnic Origin of your:

Father

Mother

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Caucasian (please check specific geographic area below if known) |
| <input type="checkbox"/> | <input type="checkbox"/> | Northern Europe (Austria, Denmark, Finland, France, Germany, Netherlands, Norway, Sweden, Switzerland, U.K.) |
| <input type="checkbox"/> | <input type="checkbox"/> | Southern Europe (Greece, Italy, Spain) |
| <input type="checkbox"/> | <input type="checkbox"/> | Eastern Europe (Czechoslovakia, Hungary, Poland, Russia, Yugoslavia) |
| <input type="checkbox"/> | <input type="checkbox"/> | Middle Eastern (Israel, Egypt, Iran, Iraq, Jordan, Syria, other Arab States) |
| <input type="checkbox"/> | <input type="checkbox"/> | African-American |
| <input type="checkbox"/> | <input type="checkbox"/> | Hispanic (please check specific geographic area below if known) |
| <input type="checkbox"/> | <input type="checkbox"/> | Mexico |
| <input type="checkbox"/> | <input type="checkbox"/> | Central America, South American |
| <input type="checkbox"/> | <input type="checkbox"/> | Cuba, Puerto Rico, other Caribbean |
| <input type="checkbox"/> | <input type="checkbox"/> | Asian (please check specific geographic area below if known) |
| <input type="checkbox"/> | <input type="checkbox"/> | Japanese |
| <input type="checkbox"/> | <input type="checkbox"/> | Chinese |
| <input type="checkbox"/> | <input type="checkbox"/> | Korean |
| <input type="checkbox"/> | <input type="checkbox"/> | Vietnamese |
| <input type="checkbox"/> | <input type="checkbox"/> | other Asian |
| <input type="checkbox"/> | <input type="checkbox"/> | Other _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | Don't know |

Health information: Have you or has anyone in your immediate family (parents, brothers, sisters, or your children) had the following? Check all that apply

Disease: You Mother Father Sister Brother Child

Heart Disease	Stroke or Arteriosclerosis
Cancer (Specify type if known)	
Alzheimer's Disease or Dementia	
Chronic Inflammatory or Autoimmune Disease	
Nervous System Disease like Multiple Sclerosis	
Other (please specify)	

Additional health information details you would like to provide:

FIG. 3

Sample Banks

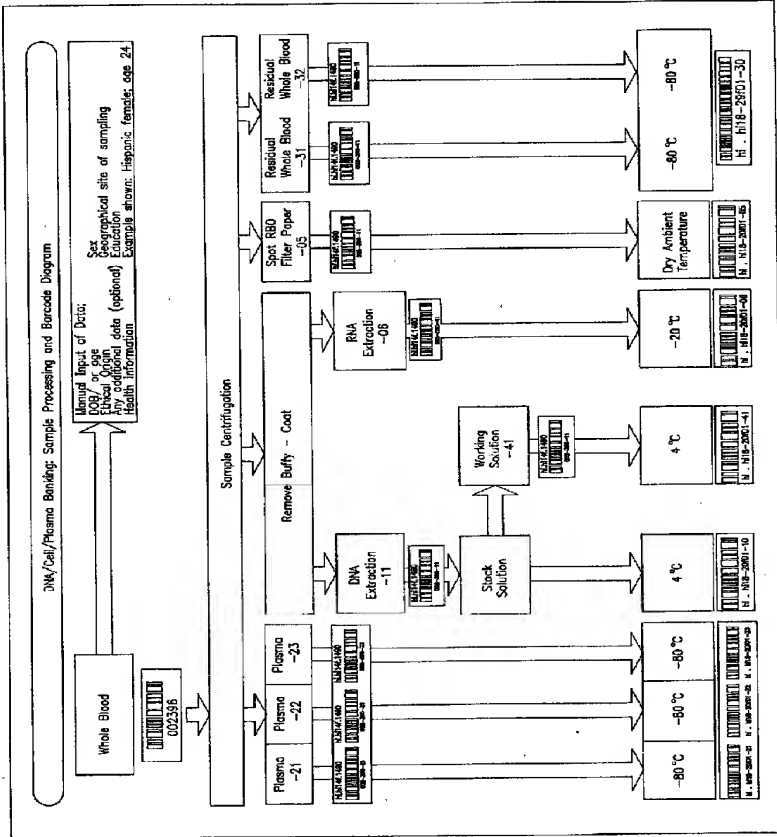


FIG. 4

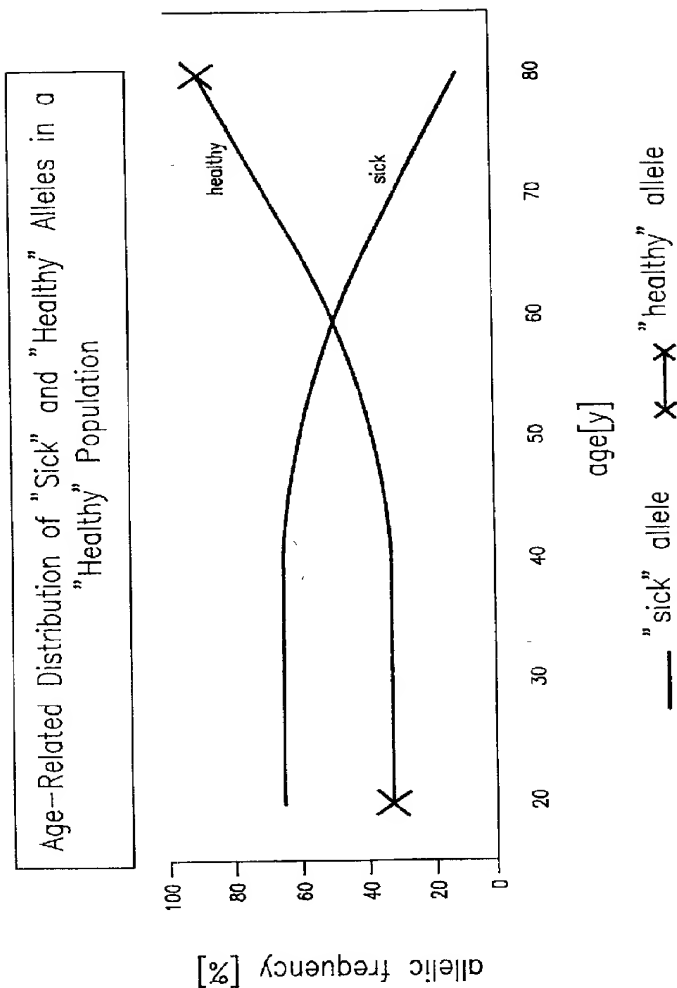


FIG. 5

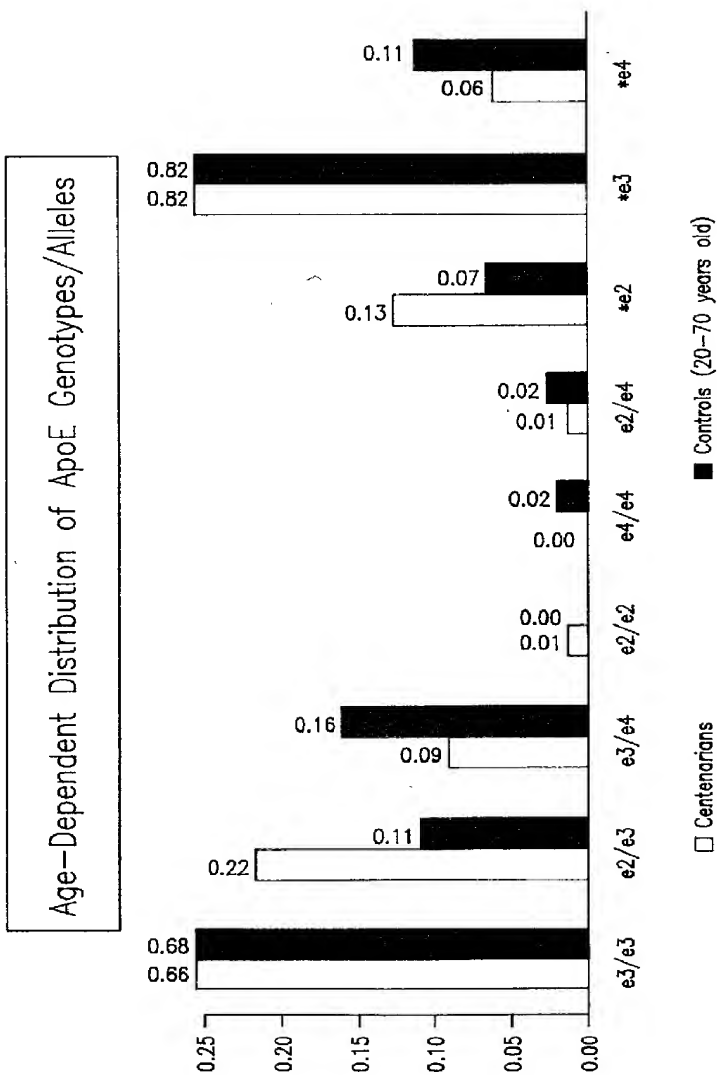


FIG. 6

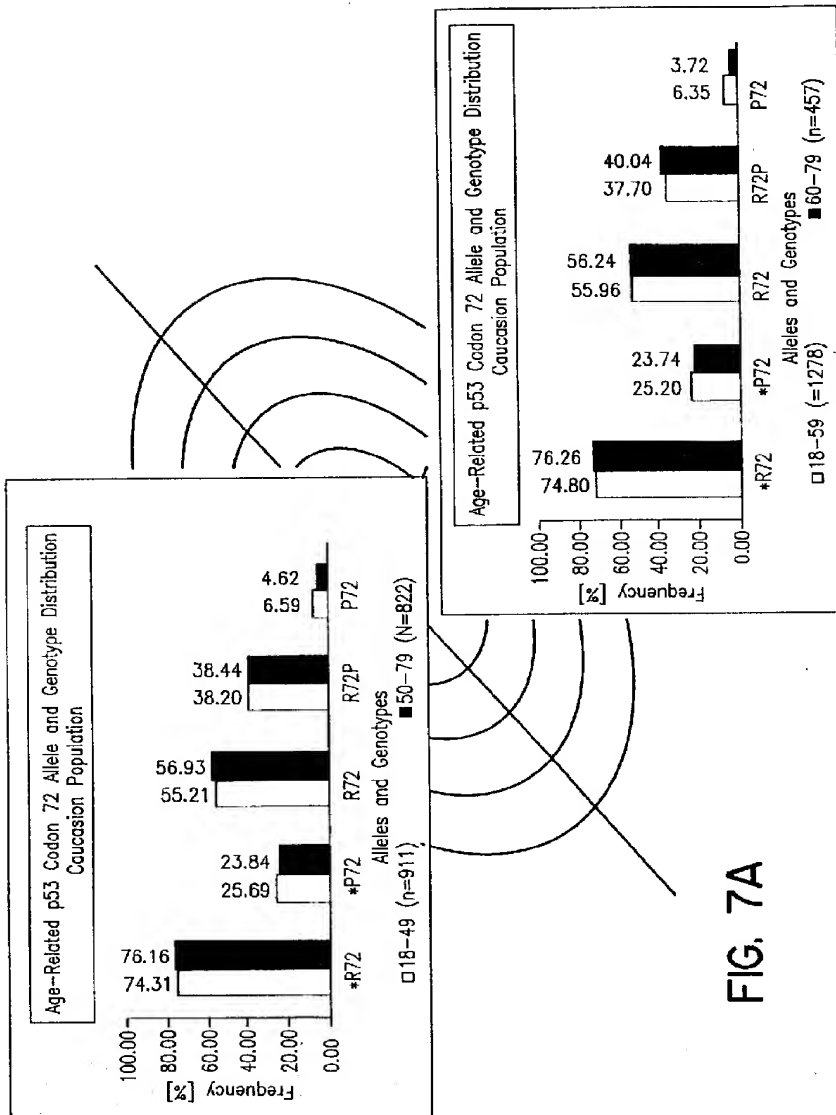


FIG. 7A

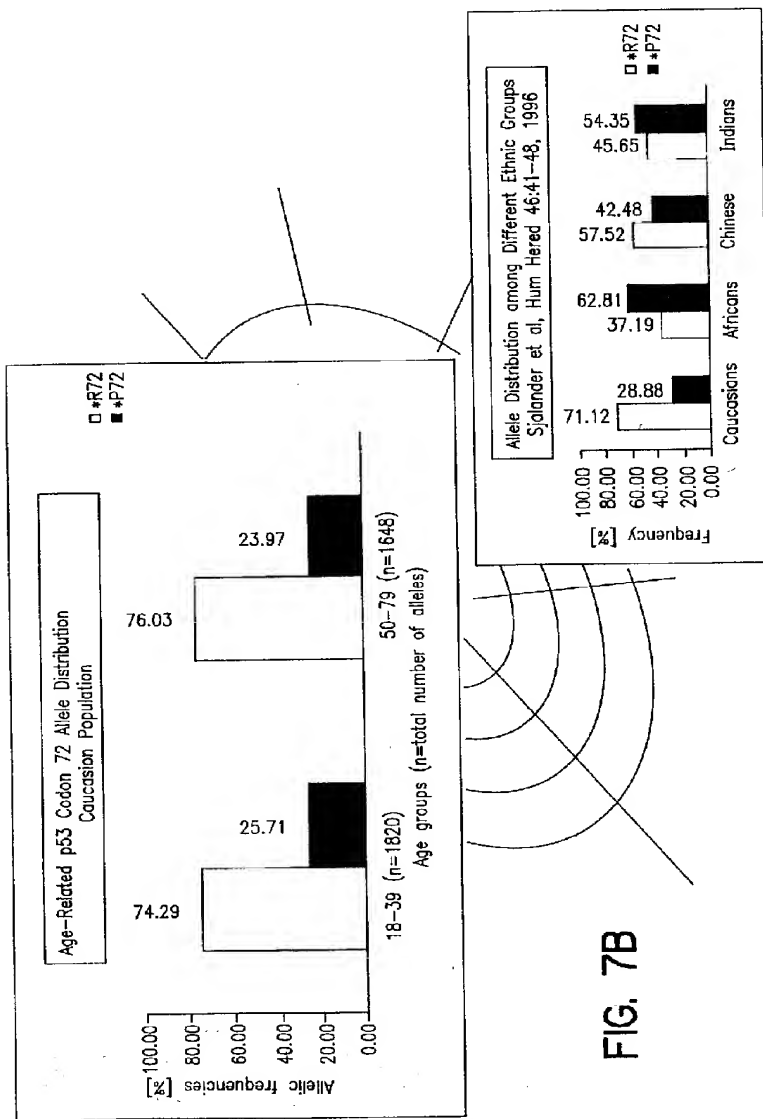
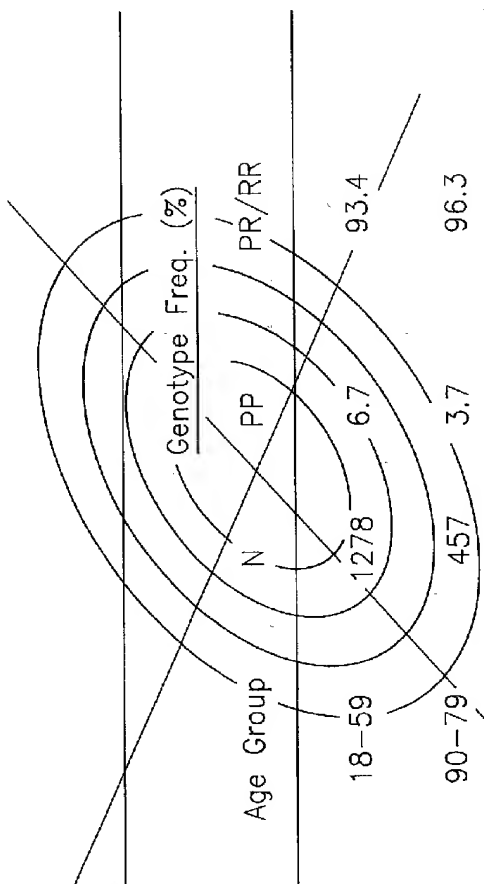


FIG. 7B

FIG. 7C

P53 PP vs. PR/RR Genotype Distribution
By Age cut point = 59



Genomic Organization of the p53 Gene

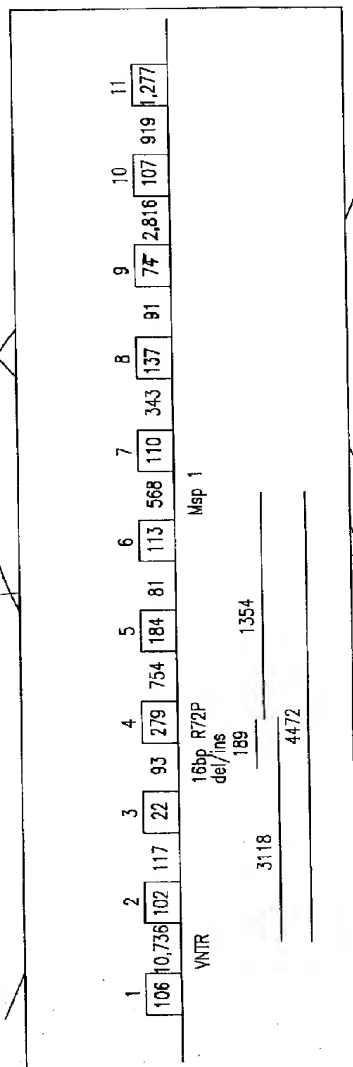
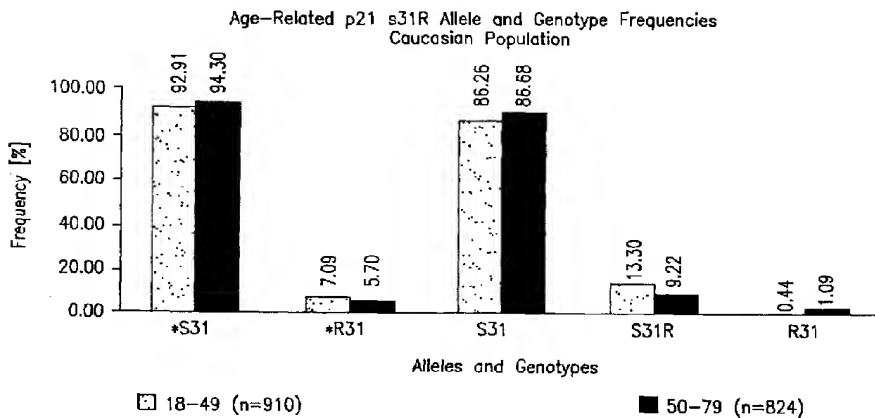


FIG. 7D



Significance: Genotype frequency of SR heterozygous
drops from 13.3% to 9.2%; $p=0.009$

FIG. 8

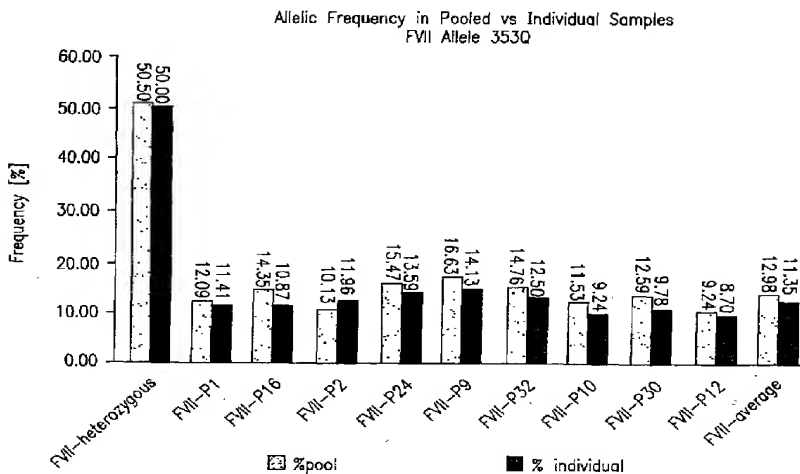


FIG. 9

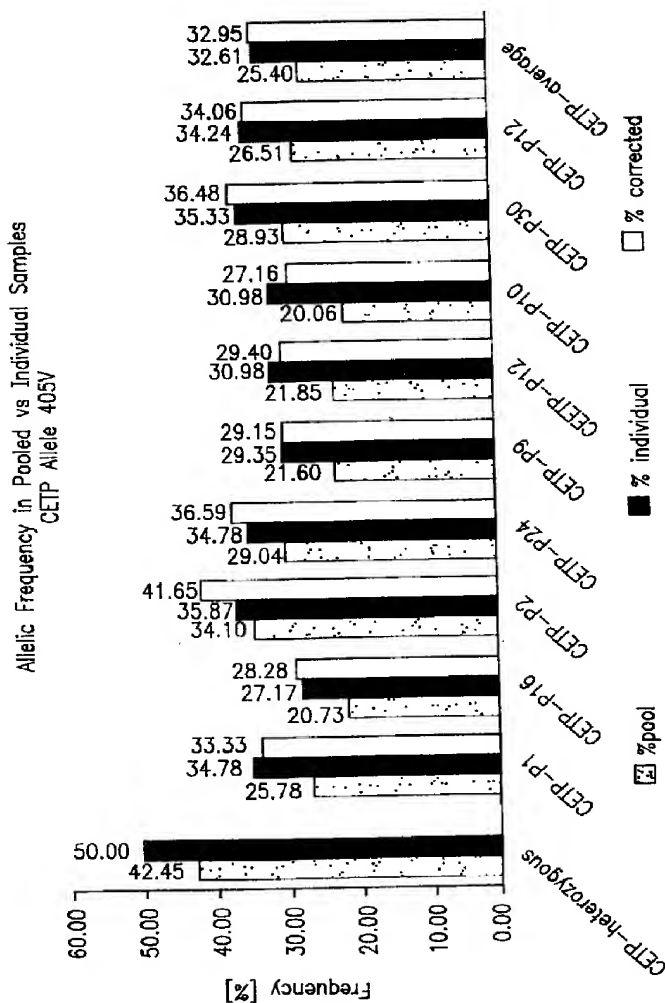


FIG. 10

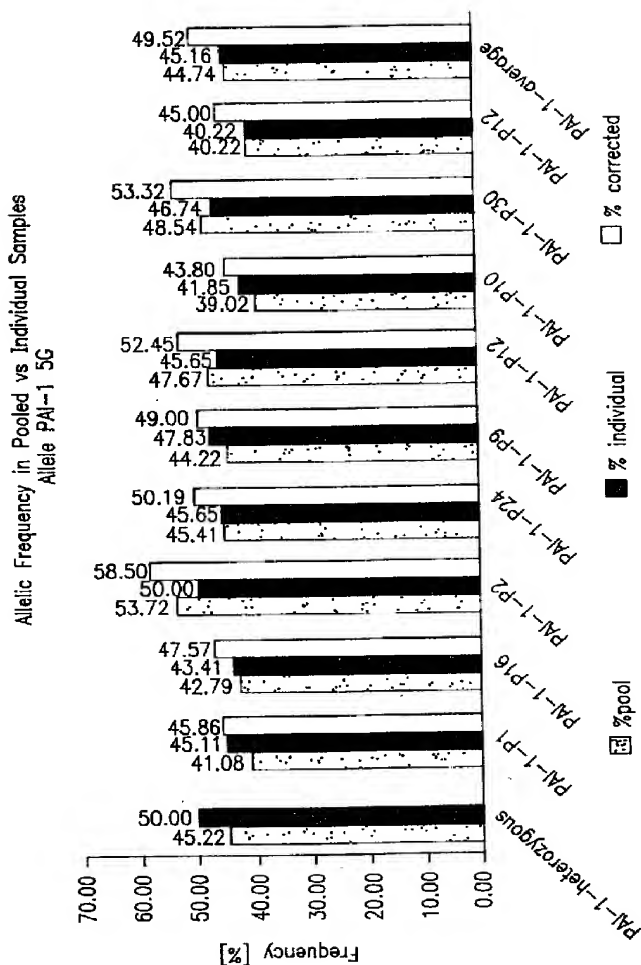


FIG. 11

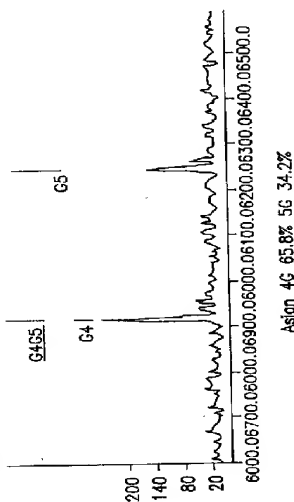


FIG. 12A

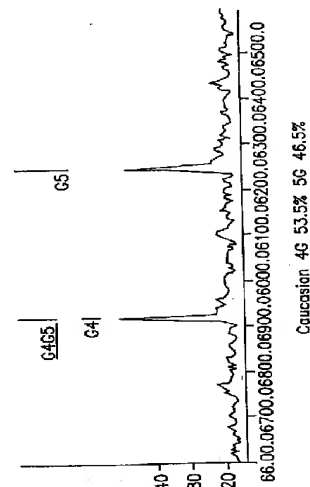


FIG. 12C

Asian 4G 65.8% 5G 34.2%

FIG. 12B

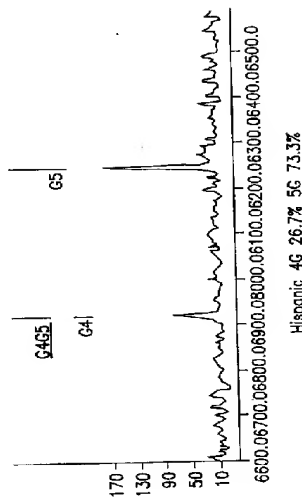


FIG. 12D

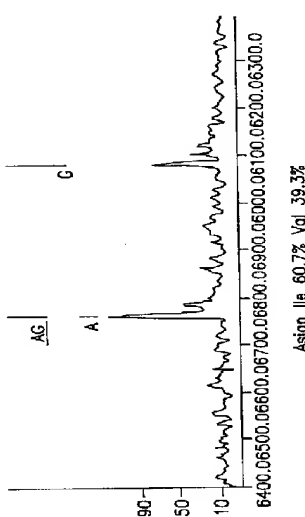


FIG. 13B

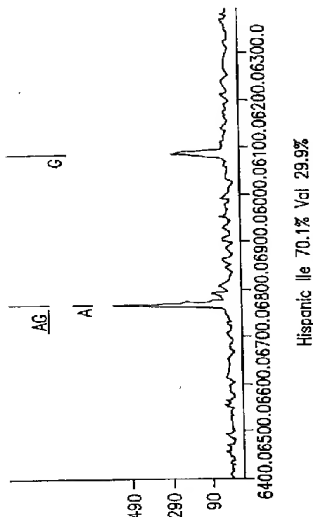


FIG. 13C

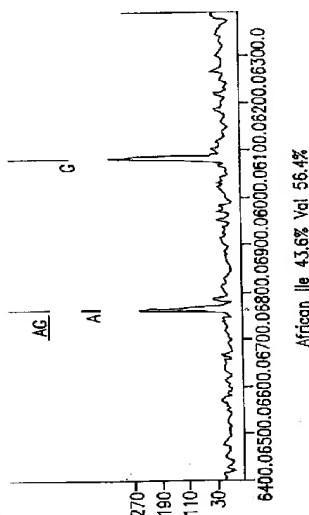


FIG. 13A

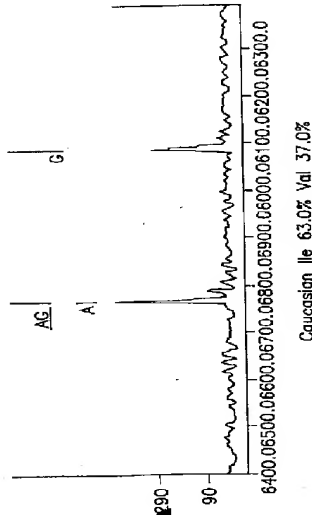


FIG. 13D

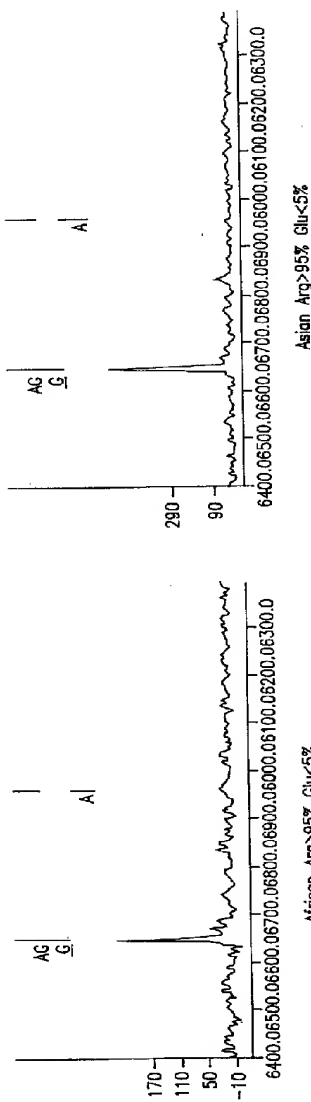


FIG. 14A

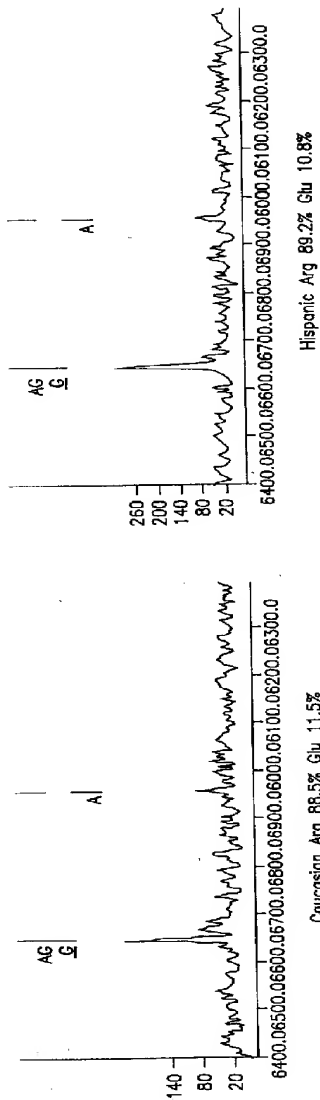


FIG. 14B

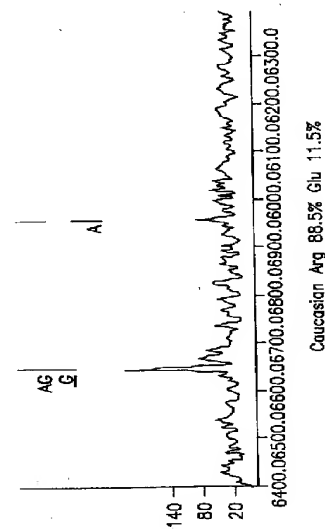


FIG. 14C

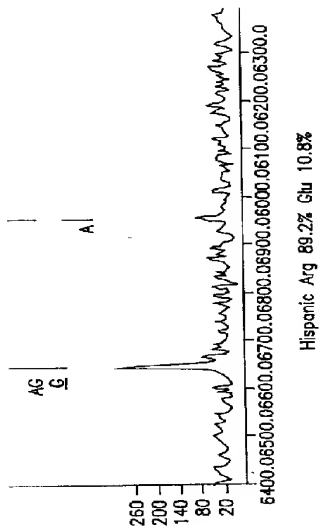


FIG. 14D

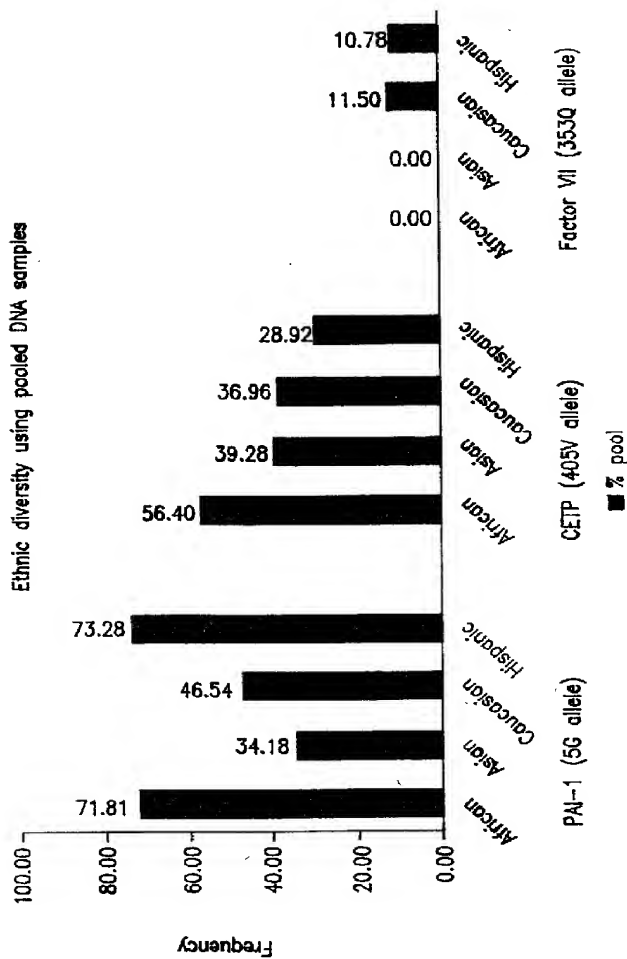


FIG. 15

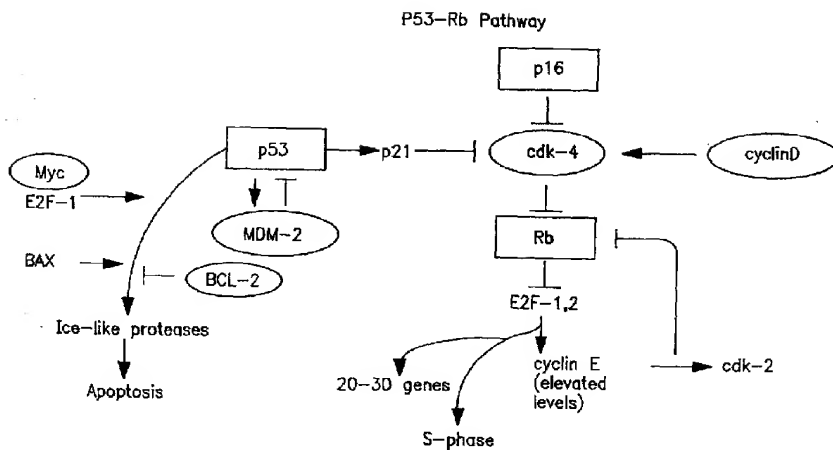


FIG. 16

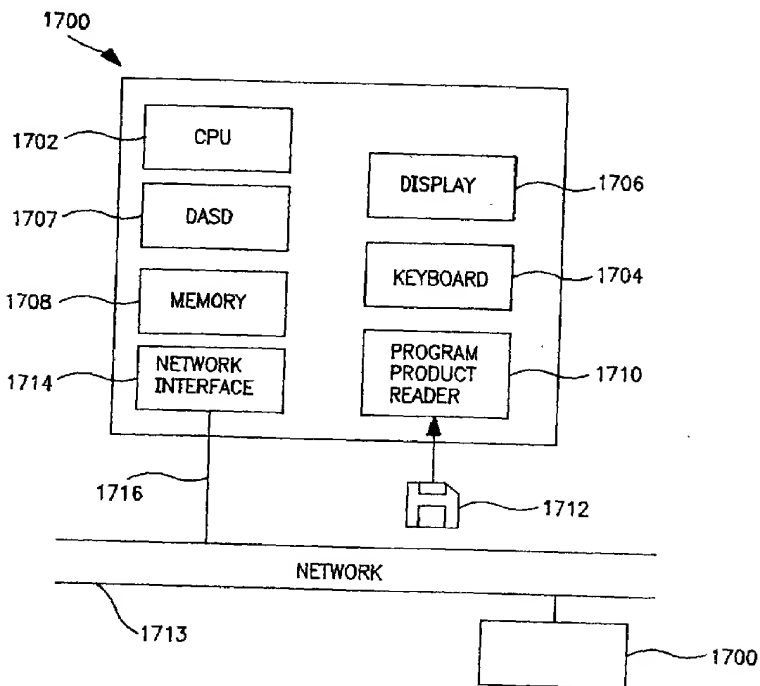


FIG. 17

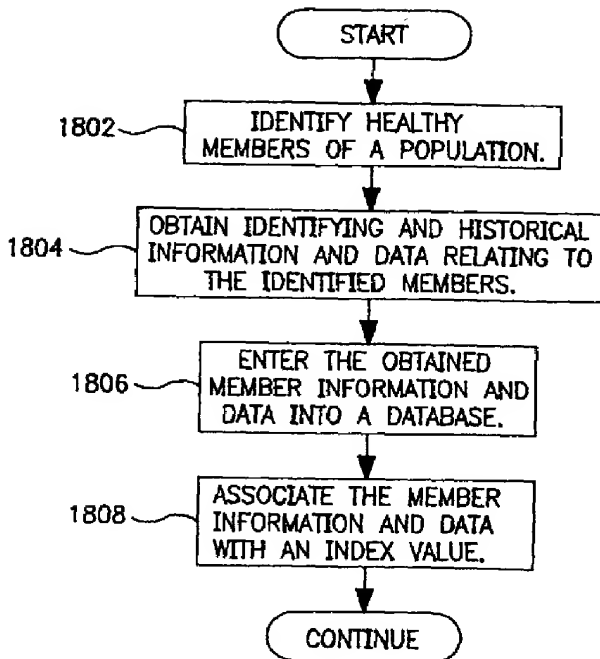


FIG. 18

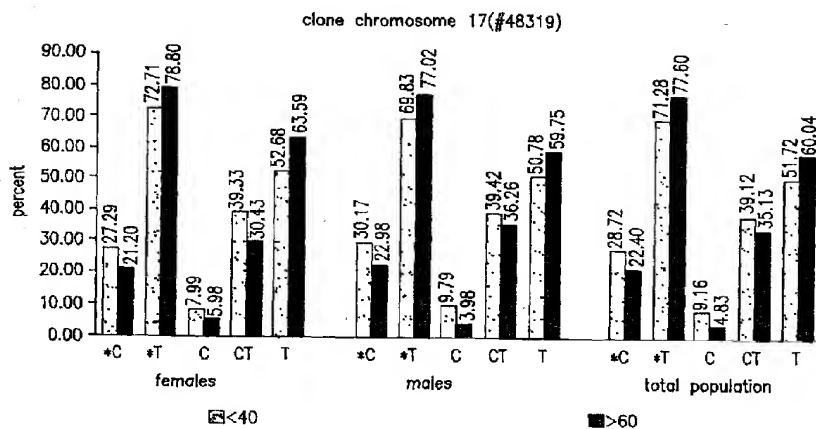


FIG. 19

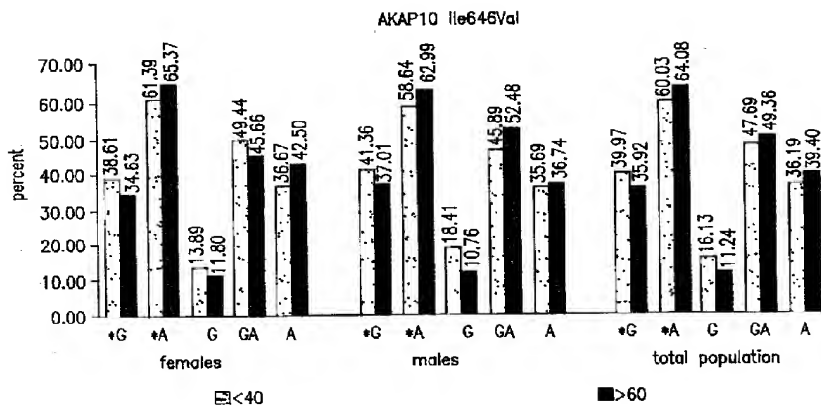


FIG. 20

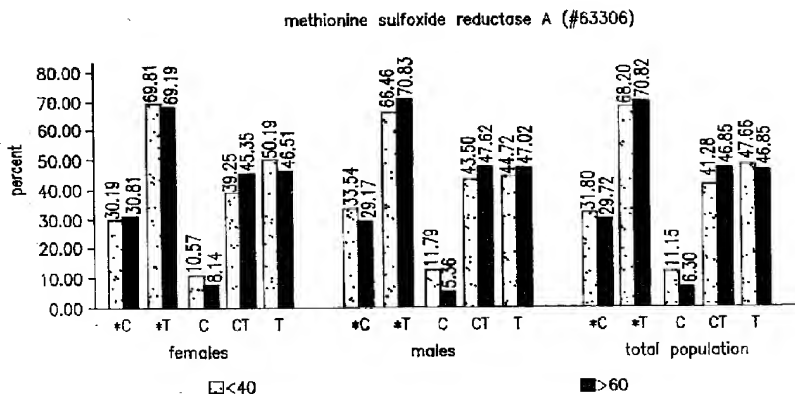


FIG. 21

FIG. 22A

Have you ever smoked? ☐ Yes ☐ No

Have you been hospitalized in the past 5 years for or more than 6 days at a time?
☐ Yes ☐ No

If yes, how many times?
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50 ☐ 51 ☐ 52 ☐ 53 ☐ 54 ☐ 55 ☐ 56 ☐ 57 ☐ 58 ☐ 59 ☐ 60 ☐ 61 ☐ 62 ☐ 63 ☐ 64 ☐ 65 ☐ 66 ☐ 67 ☐ 68 ☐ 69 ☐ 70 ☐ 71 ☐ 72 ☐ 73 ☐ 74 ☐ 75 ☐ 76 ☐ 77 ☐ 78 ☐ 79 ☐ 80 ☐ 81 ☐ 82 ☐ 83 ☐ 84 ☐ 85 ☐ 86 ☐ 87 ☐ 88 ☐ 89 ☐ 90 ☐ 91 ☐ 92 ☐ 93 ☐ 94 ☐ 95 ☐ 96 ☐ 97 ☐ 98 ☐ 99 ☐ 100 ☐ 101 ☐ 102 ☐ 103 ☐ 104 ☐ 105 ☐ 106 ☐ 107 ☐ 108 ☐ 109 ☐ 110 ☐ 111 ☐ 112 ☐ 113 ☐ 114 ☐ 115 ☐ 116 ☐ 117 ☐ 118 ☐ 119 ☐ 120 ☐ 121 ☐ 122 ☐ 123 ☐ 124 ☐ 125 ☐ 126 ☐ 127 ☐ 128 ☐ 129 ☐ 130 ☐ 131 ☐ 132 ☐ 133 ☐ 134 ☐ 135 ☐ 136 ☐ 137 ☐ 138 ☐ 139 ☐ 140 ☐ 141 ☐ 142 ☐ 143 ☐ 144 ☐ 145 ☐ 146 ☐ 147 ☐ 148 ☐ 149 ☐ 150 ☐ 151 ☐ 152 ☐ 153 ☐ 154 ☐ 155 ☐ 156 ☐ 157 ☐ 158 ☐ 159 ☐ 160 ☐ 161 ☐ 162 ☐ 163 ☐ 164 ☐ 165 ☐ 166 ☐ 167 ☐ 168 ☐ 169 ☐ 170 ☐ 171 ☐ 172 ☐ 173 ☐ 174 ☐ 175 ☐ 176 ☐ 177 ☐ 178 ☐ 179 ☐ 180 ☐ 181 ☐ 182 ☐ 183 ☐ 184 ☐ 185 ☐ 186 ☐ 187 ☐ 188 ☐ 189 ☐ 190 ☐ 191 ☐ 192 ☐ 193 ☐ 194 ☐ 195 ☐ 196 ☐ 197 ☐ 198 ☐ 199 ☐ 200 ☐ 201 ☐ 202 ☐ 203 ☐ 204 ☐ 205 ☐ 206 ☐ 207 ☐ 208 ☐ 209 ☐ 210 ☐ 211 ☐ 212 ☐ 213 ☐ 214 ☐ 215 ☐ 216 ☐ 217 ☐ 218 ☐ 219 ☐ 220 ☐ 221 ☐ 222 ☐ 223 ☐ 224 ☐ 225 ☐ 226 ☐ 227 ☐ 228 ☐ 229 ☐ 230 ☐ 231 ☐ 232 ☐ 233 ☐ 234 ☐ 235 ☐ 236 ☐ 237 ☐ 238 ☐ 239 ☐ 240 ☐ 241 ☐ 242 ☐ 243 ☐ 244 ☐ 245 ☐ 246 ☐ 247 ☐ 248 ☐ 249 ☐ 250 ☐ 251 ☐ 252 ☐ 253 ☐ 254 ☐ 255 ☐ 256 ☐ 257 ☐ 258 ☐ 259 ☐ 260 ☐ 261 ☐ 262 ☐ 263 ☐ 264 ☐ 265 ☐ 266 ☐ 267 ☐ 268 ☐ 269 ☐ 270 ☐ 271 ☐ 272 ☐ 273 ☐ 274 ☐ 275 ☐ 276 ☐ 277 ☐ 278 ☐ 279 ☐ 280 ☐ 281 ☐ 282 ☐ 283 ☐ 284 ☐ 285 ☐ 286 ☐ 287 ☐ 288 ☐ 289 ☐ 290 ☐ 291 ☐ 292 ☐ 293 ☐ 294 ☐ 295 ☐ 296 ☐ 297 ☐ 298 ☐ 299 ☐ 300 ☐ 301 ☐ 302 ☐ 303 ☐ 304 ☐ 305 ☐ 306 ☐ 307 ☐ 308 ☐ 309 ☐ 310 ☐ 311 ☐ 312 ☐ 313 ☐ 314 ☐ 315 ☐ 316 ☐ 317 ☐ 318 ☐ 319 ☐ 320 ☐ 321 ☐ 322 ☐ 323 ☐ 324 ☐ 325 ☐ 326 ☐ 327 ☐ 328 ☐ 329 ☐ 330 ☐ 331 ☐ 332 ☐ 333 ☐ 334 ☐ 335 ☐ 336 ☐ 337 ☐ 338 ☐ 339 ☐ 340 ☐ 341 ☐ 342 ☐ 343 ☐ 344 ☐ 345 ☐ 346 ☐ 347 ☐ 348 ☐ 349 ☐ 350 ☐ 351 ☐ 352 ☐ 353 ☐ 354 ☐ 355 ☐ 356 ☐ 357 ☐ 358 ☐ 359 ☐ 360 ☐ 361 ☐ 362 ☐ 363 ☐ 364 ☐ 365 ☐ 366 ☐ 367 ☐ 368 ☐ 369 ☐ 370 ☐ 371 ☐ 372 ☐ 373 ☐ 374 ☐ 375 ☐ 376 ☐ 377 ☐ 378 ☐ 379 ☐ 380 ☐ 381 ☐ 382 ☐ 383 ☐ 384 ☐ 385 ☐ 386 ☐ 387 ☐ 388 ☐ 389 ☐ 390 ☐ 391 ☐ 392 ☐ 393 ☐ 394 ☐ 395 ☐ 396 ☐ 397 ☐ 398 ☐ 399 ☐ 400 ☐ 401 ☐ 402 ☐ 403 ☐ 404 ☐ 405 ☐ 406 ☐ 407 ☐ 408 ☐ 409 ☐ 41

FIG. 22B

FIG. 22C

What is your highest grade you completed in school?
☐ less than 8th grade
☐ 8th, 9th, 10th, or 11th grade
☐ high school graduate or equivalency
☐ some college, 2yr degree
☐ college graduate, 4yr degree
☐ post graduate education or degree

Mother Deceased? Cause of Death Mother: ☐ Yes ☐ No
 If Yes at what age?
 < 29 ☐ Heart Disease
 30-39 ☐ Cancer
 40-49 ☐ Stroke
 50-59 ☐ Accident
 60-69 ☐ Suicide
 70-79 ☐ Other, _____
 80-89 ☐
 ≥ 90 ☐

Father Deceased? Cause of Death Father: ☐ Yes ☐ No
 If Yes at what age?
 < 29 ☐ Heart Disease
 30-39 ☐ Cancer
 40-49 ☐ Stroke
 50-59 ☐ Accident
 60-69 ☐ Suicide
 70-79 ☐ Other, _____
 80-89 ☐
 > 90 ☐

Health Information

Have you or has anyone in your immediate family (parents, brothers, sisters, or your children) had the following?

Mark all that apply!

Disease	You	Mother	Father	Sister	Brother	Child
Heart Disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stroke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hypertension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blood clots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diabetes, insulin dependent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diabetes, not insulin-dependent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cancer:						
Lung & Bronchus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Breast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prostate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Colon & Rectum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lymphoma & Leukemia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify below:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alzheimer's Disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Epilepsy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schizophrenia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bipolar disorder (manic depression)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Major depression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chronic Inflammatory or Autoimmune Disease including Multiple Sclerosis and Rheumatoid Arthritis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Erythema	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Asthma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify below:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you take prescription drugs on a regular basis?

If yes, please specify below:

☐ Yes ☐ No Have you ever donated blood before? ☐ Yes ☐ No

If yes, how many times: Number of Times

 Have you been hospitalized in the past 5 years for more than 6 days at a time?
☐ Yes ☐ No

If yes, how many times?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50 ☐ 51 ☐ 52 ☐ 53 ☐ 54 ☐ 55 ☐ 56 ☐ 57 ☐ 58 ☐ 59 ☐ 60 ☐ 61 ☐ 62 ☐ 63 ☐ 64 ☐ 65 ☐ 66 ☐ 67 ☐ 68 ☐ 69 ☐ 70 ☐ 71 ☐ 72 ☐ 73 ☐ 74 ☐ 75 ☐ 76 ☐ 77 ☐ 78 ☐ 79 ☐ 80 ☐ 81 ☐ 82 ☐ 83 ☐ 84 ☐ 85 ☐ 86 ☐ 87 ☐ 88 ☐ 89 ☐ 90 ☐ 91 ☐ 92 ☐ 93 ☐ 94 ☐ 95 ☐ 96 ☐ 97 ☐ 98 ☐ 99 ☐ 100 ☐ 101 ☐ 102 ☐ 103 ☐ 104 ☐ 105 ☐ 106 ☐ 107 ☐ 108 ☐ 109 ☐ 110 ☐ 111 ☐ 112 ☐ 113 ☐ 114 ☐ 115 ☐ 116 ☐ 117 ☐ 118 ☐ 119 ☐ 120 ☐ 121 ☐ 122 ☐ 123 ☐ 124 ☐ 125 ☐ 126 ☐ 127 ☐ 128 ☐ 129 ☐ 130 ☐ 131 ☐ 132 ☐ 133 ☐ 134 ☐ 135 ☐ 136 ☐ 137 ☐ 138 ☐ 139 ☐ 140 ☐ 141 ☐ 142 ☐ 143 ☐ 144 ☐ 145 ☐ 146 ☐ 147 ☐ 148 ☐ 149 ☐ 150 ☐ 151 ☐ 152 ☐ 153 ☐ 154 ☐ 155 ☐ 156 ☐ 157 ☐ 158 ☐ 159 ☐ 160 ☐ 161 ☐ 162 ☐ 163 ☐ 164 ☐ 165 ☐ 166 ☐ 167 ☐ 168 ☐ 169 ☐ 170 ☐ 171 ☐ 172 ☐ 173 ☐ 174 ☐ 175 ☐ 176 ☐ 177 ☐ 178 ☐ 179 ☐ 180 ☐ 181 ☐ 182 ☐ 183 ☐ 184 ☐ 185 ☐ 186 ☐ 187 ☐ 188 ☐ 189 ☐ 190 ☐ 191 ☐ 192 ☐ 193 ☐ 194 ☐ 195 ☐ 196 ☐ 197 ☐ 198 ☐ 199 ☐ 200 ☐ 201 ☐ 202 ☐ 203 ☐ 204 ☐ 205 ☐ 206 ☐ 207 ☐ 208 ☐ 209 ☐ 210 ☐ 211 ☐ 212 ☐ 213 ☐ 214 ☐ 215 ☐ 216 ☐ 217 ☐ 218 ☐ 219 ☐ 220 ☐ 221 ☐ 222 ☐ 223 ☐ 224 ☐ 225 ☐ 226 ☐ 227 ☐ 228 ☐ 229 ☐ 230 ☐ 231 ☐ 232 ☐ 233 ☐ 234 ☐ 235 ☐ 236 ☐ 237 ☐ 238 ☐ 239 ☐ 240 ☐ 241 ☐ 242 ☐ 243 ☐ 244 ☐ 245 ☐ 246 ☐ 247 ☐ 248 ☐ 249 ☐ 250 ☐ 251 ☐ 252 ☐ 253 ☐ 254 ☐ 255 ☐ 256 ☐ 257 ☐ 258 ☐ 259 ☐ 260 ☐ 261 ☐ 262 ☐ 263 ☐ 264 ☐ 265 ☐ 266 ☐ 267 ☐ 268 ☐ 269 ☐ 270 ☐ 271 ☐ 272 ☐ 273 ☐ 274 ☐ 275 ☐ 276 ☐ 277 ☐ 278 ☐ 279 ☐ 280 ☐ 281 ☐ 282 ☐ 283 ☐ 284 ☐ 285 ☐ 286 ☐ 287 ☐ 288 ☐ 289 ☐ 290 ☐ 291 ☐ 292 ☐ 293 ☐ 294 ☐ 295 ☐ 296 ☐ 297 ☐ 298 ☐ 299 ☐ 300 ☐ 301 ☐ 302 ☐ 303 ☐ 304 ☐ 305 ☐ 306 ☐ 307 ☐ 308 ☐ 309 ☐ 310 ☐ 311 ☐ 312 ☐ 313 ☐ 314 ☐ 315 ☐ 316 ☐ 317 ☐ 318 ☐ 319 ☐ 320 ☐ 321 ☐ 322 ☐ 323 ☐ 324 ☐ 325 ☐ 326 ☐ 327 ☐ 328 ☐ 329 ☐ 330 ☐ 331 ☐ 332 ☐ 333 ☐ 334 ☐ 335 ☐ 336 ☐ 337 ☐ 338 ☐ 339 ☐ 340 ☐ 341 ☐ 342 ☐ 343 ☐ 344 ☐ 345 ☐ 346 ☐ 347 ☐ 348 ☐ 349 ☐ 350 ☐ 351 ☐ 352 ☐ 353 ☐ 354 ☐ 355 ☐ 356 ☐ 357 ☐ 358 ☐ 359 ☐ 360 ☐ 361 ☐ 362 ☐ 363 ☐ 364 ☐ 365 ☐ 366 ☐ 367 ☐ 368 ☐ 369 ☐ 370 ☐ 371 ☐ 372 ☐ 373 ☐ 374 ☐ 375 ☐ 376 ☐ 377 ☐ 378 ☐ 379 ☐ 380 ☐ 381 ☐ 382 ☐ 383 ☐ 384 ☐ 385 ☐ 386 ☐ 387 ☐ 388 ☐ 389 ☐ 390 ☐ 391 ☐ 392 ☐ 393 ☐ 394 ☐ 395 ☐ 396 ☐ 397 ☐ 398 ☐ 399 ☐ 400 ☐ 401 ☐ 402 ☐ 403 ☐ 404 ☐ 405 ☐ 406 ☐ 407 ☐ 408 ☐ 409 ☐ 410 ☐ 411 ☐ 412 ☐ 413 ☐ 414 ☐ 415 ☐ 416 ☐ 417 ☐ 418 ☐ 419 ☐ 420 ☐ 421 ☐ 422 ☐ 423 ☐ 424 ☐ 425 ☐ 426 ☐ 427 ☐ 428 ☐ 429 ☐ 430 ☐ 431 ☐ 432 ☐ 433 ☐ 434 ☐ 435 ☐ 436 ☐ 437 ☐ 438 ☐ 439 ☐ 440 ☐ 441 ☐ 442 ☐ 443 ☐ 444 ☐ 445 ☐ 446 ☐ 447 ☐ 448 ☐ 449 ☐ 450 ☐ 451 ☐ 452 ☐ 453 ☐ 454 ☐ 455 ☐ 456 ☐ 457 ☐ 458 ☐ 459 ☐ 460 ☐ 461 ☐ 462 ☐ 463 ☐ 464 ☐ 465 ☐ 466 ☐ 467 ☐ 468 ☐ 469 ☐ 470 ☐ 471 ☐ 472 ☐ 473 ☐ 474 ☐ 475 ☐ 476 ☐ 477 ☐ 478 ☐ 479 ☐ 480 ☐ 481 ☐ 482 ☐ 483 ☐ 484 ☐ 485 ☐ 486 ☐ 487 ☐ 488 ☐ 489 ☐ 490 ☐ 491 ☐ 492 ☐ 493 ☐ 494 ☐ 495 ☐ 496 ☐ 497 ☐ 498 ☐ 499 ☐ 500 ☐ 501 ☐ 502 ☐ 503 ☐ 504 ☐ 505 ☐ 506 ☐ 507 ☐ 508 ☐ 509 ☐ 510 ☐ 511 ☐ 512 ☐ 513 ☐ 514 ☐ 515 ☐ 516 ☐ 517 ☐ 518 ☐ 519 ☐ 520 ☐ 521 ☐ 522 ☐ 523 ☐ 524 ☐ 525 ☐ 526 ☐ 527 ☐ 528 ☐ 529 ☐ 530 ☐ 531 ☐ 532 ☐ 533 ☐ 534 ☐ 535 ☐ 536 ☐ 537 ☐ 538 ☐ 539 ☐ 540 ☐ 541 ☐ 542 ☐ 543 ☐ 544 ☐ 545 ☐ 546 ☐ 547 ☐ 548 ☐ 549 ☐ 550 ☐ 551 ☐ 552 ☐ 553 ☐ 554 ☐ 555 ☐ 556 ☐ 557 ☐ 558 ☐ 559 ☐ 560 ☐ 561 ☐ 562 ☐ 563 ☐ 564 ☐ 565 ☐ 566 ☐ 567 ☐ 568 ☐ 569 ☐ 570 ☐ 571 ☐ 572 ☐ 573 ☐ 574 ☐ 575 ☐ 576 ☐ 577 ☐ 578 ☐ 579 ☐ 580 ☐ 581 ☐ 582 ☐ 583 ☐ 584 ☐ 585 ☐ 586 ☐ 587 ☐ 588 ☐ 589 ☐ 590 ☐ 591 ☐ 592 ☐ 593 ☐ 594 ☐ 595 ☐ 596 ☐ 597 ☐ 598 ☐ 599 ☐ 600 ☐ 601 ☐ 602 ☐ 603 ☐ 604 ☐ 605 ☐ 606 ☐ 607 ☐ 608 ☐ 609 ☐ 610 ☐ 611 ☐ 612 ☐ 613 ☐ 614 ☐ 615 ☐ 616 ☐ 617 ☐ 618 ☐ 619 ☐ 620 ☐ 621 ☐ 622 ☐ 623 ☐ 624 ☐ 625 ☐ 626 ☐ 627 ☐ 628 ☐ 629 ☐ 630 ☐ 631 ☐ 632 ☐ 633 ☐ 634 ☐ 635 ☐ 636 ☐ 637 ☐ 638 ☐ 639 ☐ 640 ☐ 641 ☐ 642 ☐ 643 ☐ 644 ☐ 645 ☐ 646 ☐ 647 ☐ 648 ☐ 649 ☐ 650 ☐ 651 ☐ 652 ☐ 653 ☐ 654 ☐ 655 ☐ 656 ☐ 657 ☐ 658 ☐ 659 ☐ 660 ☐ 661 ☐ 662 ☐ 663 ☐ 664 ☐ 665 ☐ 666 ☐ 667 ☐ 668 ☐ 669 ☐ 670 ☐ 671 ☐ 672 ☐ 673 ☐ 674 ☐ 675 ☐ 676 ☐ 677 ☐ 678 ☐ 679 ☐ 680 ☐ 681 ☐ 682 ☐ 683 ☐ 684 ☐ 685 ☐ 686 ☐ 687 ☐ 688 ☐ 689 ☐ 690 ☐ 691 ☐ 692 ☐ 693 ☐ 694 ☐ 695 ☐ 696 ☐ 697 ☐ 698 ☐ 699 ☐ 700 ☐ 701 ☐ 702 ☐ 703 ☐ 704 ☐ 705 ☐ 706 ☐ 707 ☐ 708 ☐ 709 ☐ 710 ☐ 711 ☐ 712 ☐ 713 ☐ 714 ☐ 715 ☐ 716 ☐ 717 ☐ 718 ☐ 719 ☐ 720 ☐ 721 ☐ 722 ☐ 723 ☐ 724 ☐ 725 ☐ 726 ☐ 727 ☐ 728 ☐ 729 ☐ 730 ☐ 731 ☐ 732 ☐ 733 ☐ 734 ☐ 735 ☐ 736 ☐ 737 ☐ 738 ☐ 739 ☐ 740 ☐ 741 ☐ 742 ☐ 743 ☐ 744 ☐ 745 ☐ 746 ☐ 747 ☐ 748 ☐ 749 ☐ 750 ☐ 751 ☐ 752 ☐ 753 ☐ 754 ☐ 755 ☐ 756 ☐ 757 ☐ 758 ☐ 759 ☐ 760 ☐ 761 ☐ 762 ☐ 763 ☐ 764 ☐ 765 ☐ 766 ☐ 767 ☐ 768 ☐ 769 ☐ 770 ☐ 771 ☐ 772 ☐ 773 ☐ 774 ☐ 775 ☐ 776 ☐ 777 ☐ 778 ☐ 779 ☐ 780 ☐ 781 ☐ 782 ☐ 783 ☐ 784 ☐ 785 ☐ 786 ☐ 787 ☐ 788 ☐ 789 ☐ 790 ☐ 791 ☐ 792 ☐ 793 ☐ 794 ☐ 795 ☐ 796 ☐ 797 ☐ 798 ☐ 799 ☐ 800 ☐ 801 ☐ 802 ☐ 803 ☐ 804 ☐ 805 ☐ 806 ☐ 807 ☐ 808 ☐ 809 ☐ 810 ☐ 811 ☐ 812 ☐ 813 ☐ 814 ☐ 815 ☐ 816 ☐ 817 ☐ 818 ☐ 819 ☐ 820 ☐ 821 ☐ 822 ☐ 823 ☐ 824 ☐ 825 ☐ 826 ☐ 827 ☐ 828 ☐ 829 ☐ 830 ☐ 831 ☐ 832 ☐ 833 ☐ 834 ☐ 835 ☐ 836 ☐ 837 ☐ 838 ☐ 839 ☐ 840 ☐ 841 ☐ 842 ☐ 843 ☐ 844 ☐ 845 ☐ 846 ☐ 847 ☐ 848 ☐ 849 ☐ 850 ☐ 851 ☐ 852 ☐ 853 ☐ 854 ☐ 855 ☐ 856 ☐ 857 ☐ 858 ☐ 859 ☐ 860 ☐ 861 ☐ 862 ☐ 863 ☐ 864 ☐ 865 ☐ 866 ☐ 867 ☐ 868 ☐ 869 ☐ 870 ☐ 871 ☐ 872 ☐ 873 ☐ 874 ☐ 875 ☐ 876 ☐ 877 ☐ 878 ☐ 879 ☐ 880 ☐ 881 ☐ 882 ☐ 883 ☐ 884 ☐ 885 ☐ 886 ☐ 887 ☐ 888 ☐ 889 ☐ 890 ☐ 891 ☐ 892 ☐ 893 ☐ 894 ☐ 895 ☐ 896 ☐ 897 ☐ 898 ☐ 899 ☐ 900 ☐ 901 ☐ 902 ☐ 903 ☐ 904 ☐ 905 ☐ 906 ☐ 907 ☐ 908 ☐ 909 ☐ 910 ☐ 911 ☐ 912 ☐ 913 ☐ 914 ☐ 915 ☐ 916 ☐ 917 ☐ 918 ☐ 919 ☐ 920 ☐ 921 ☐ 922 ☐ 923 ☐ 924 ☐ 925 ☐ 926 ☐ 927 ☐ 928 ☐ 929 ☐ 930 ☐ 931 ☐ 932 ☐ 933 ☐ 934 ☐ 935 ☐ 936 ☐ 937 ☐ 938 ☐ 939 ☐ 940 ☐ 941 ☐ 942 ☐ 943 ☐ 944 ☐ 945 ☐ 946 ☐ 947 ☐ 948 ☐ 949 ☐ 950 ☐ 951 ☐ 952 ☐ 953 ☐ 954 ☐ 955 ☐ 956 ☐ 957 ☐ 958 ☐ 959 ☐ 960 ☐ 961 ☐ 962 ☐ 963 ☐ 964 ☐ 965 ☐ 966 ☐ 967 ☐ 968 ☐ 969 ☐ 970 ☐ 971 ☐ 972 ☐ 973 ☐ 974 ☐ 975 ☐ 976 ☐ 97

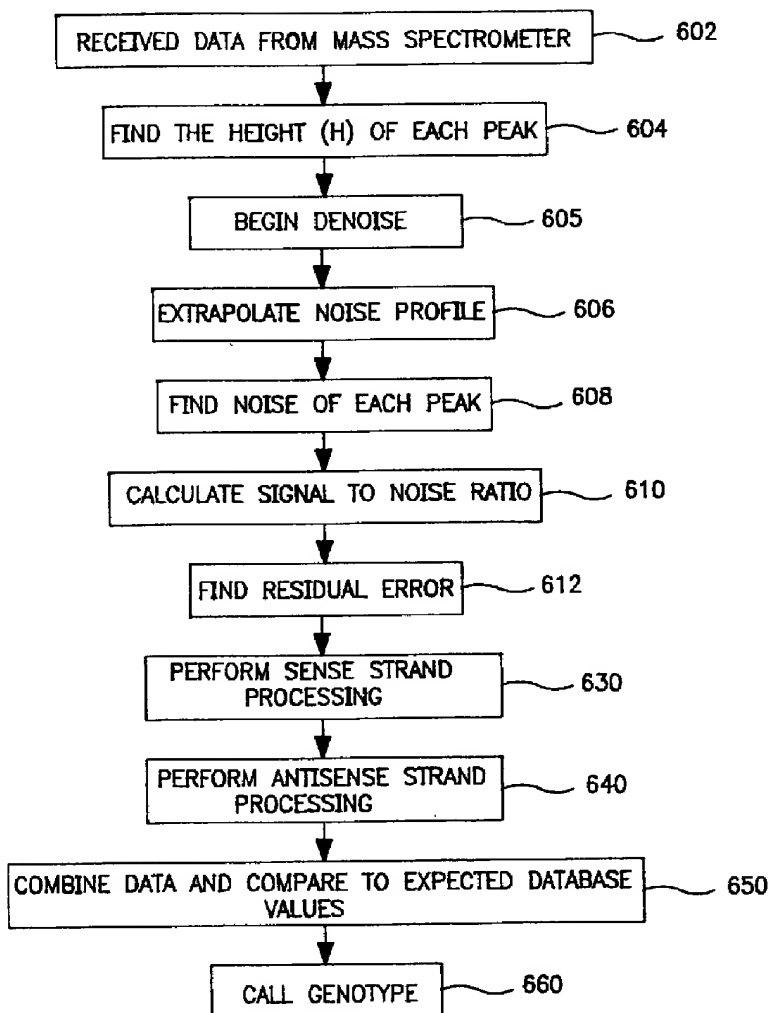


FIG. 23

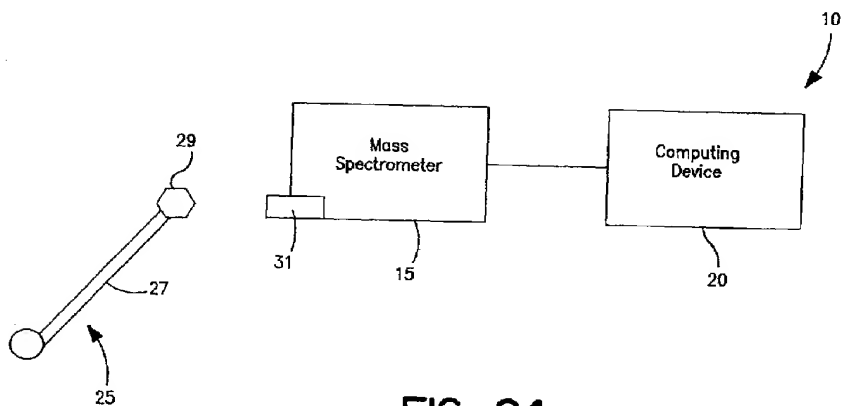


FIG. 24

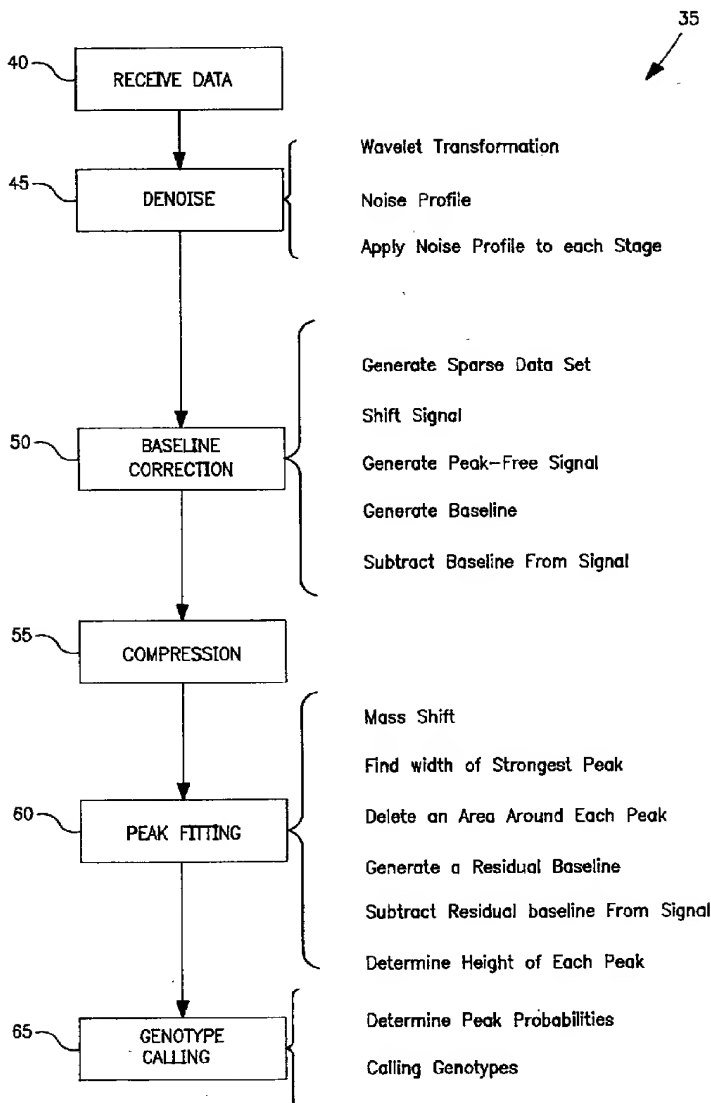


FIG. 25

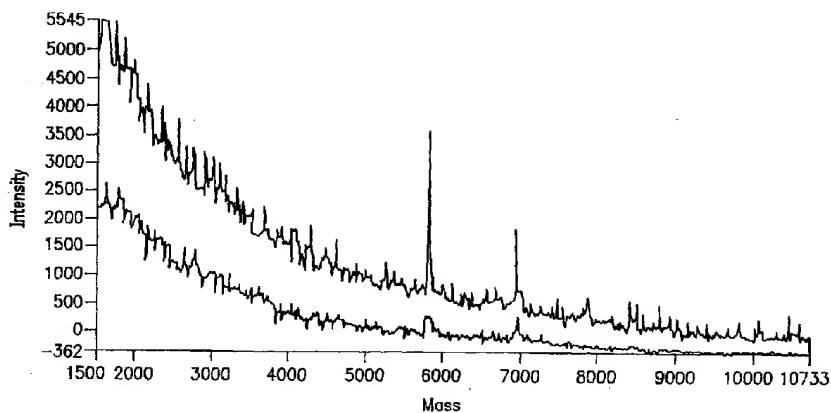


FIG. 26

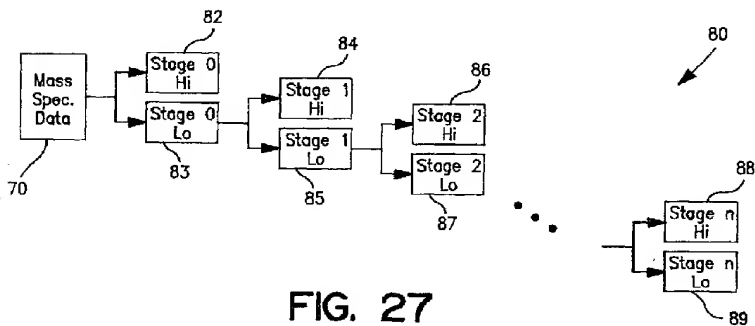


FIG. 27

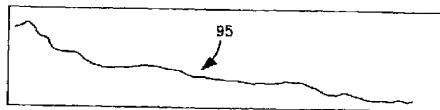


FIG. 28

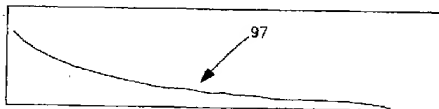


FIG. 29

Exp fitting
 $a_0 + a_1 \exp(-a_2 m)$

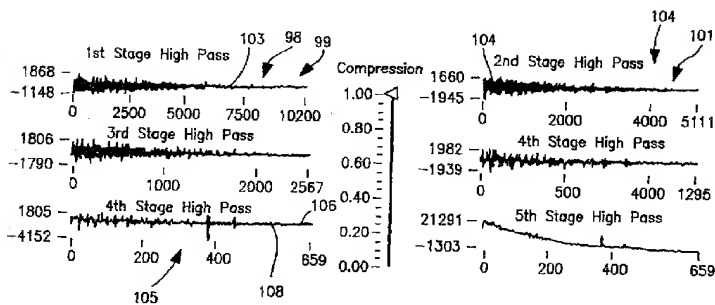


FIG. 30

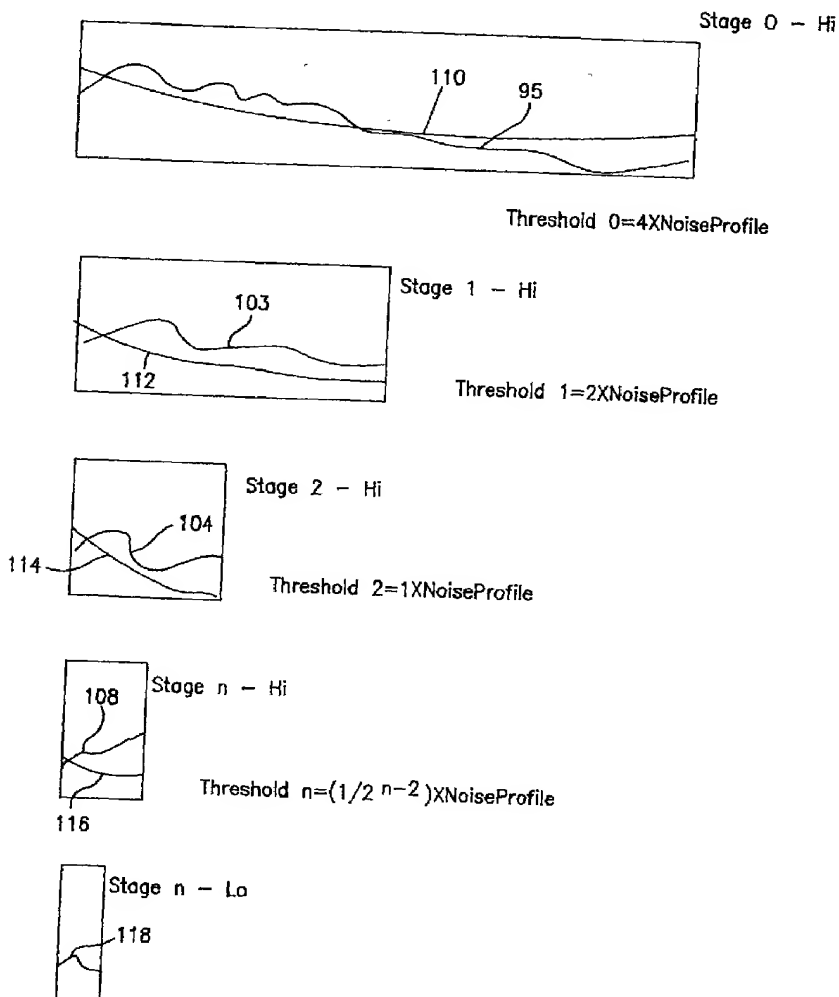


FIG. 3I

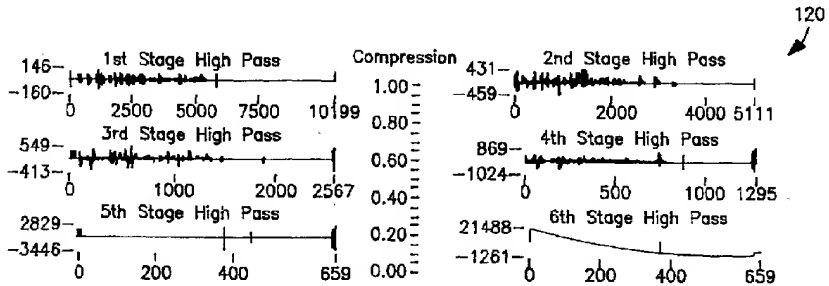


FIG. 32

$$\text{Signal } (t) = \frac{(\text{Start } 0(t) + \text{Start } 1(t) + \text{Start } 2(t) \dots + \text{Start } 23(t))}{24}$$

SHIFT SIGNAL TO ACCOUNT FOR
VARIATIONS DUE TO STARTING POINT

FIG. 33

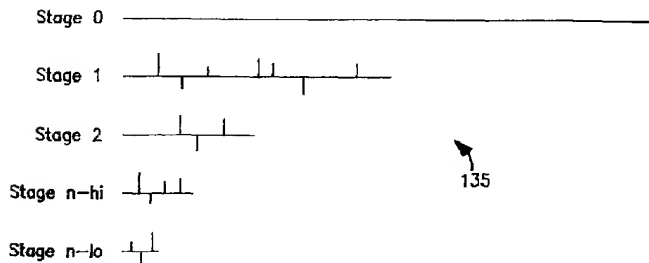


FIG. 34

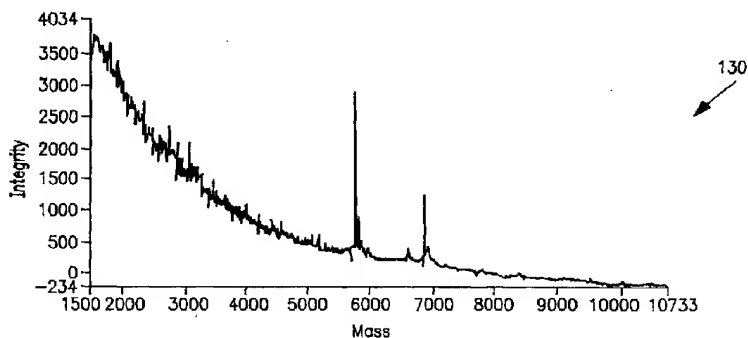


FIG. 35

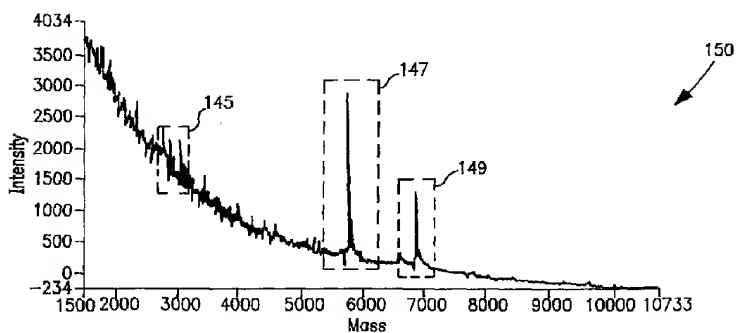


FIG. 13—TAKE A MOVING AVERAGE; REMOVE SECTIONS EXCEEDING A THRESHOLD

FIG. 36

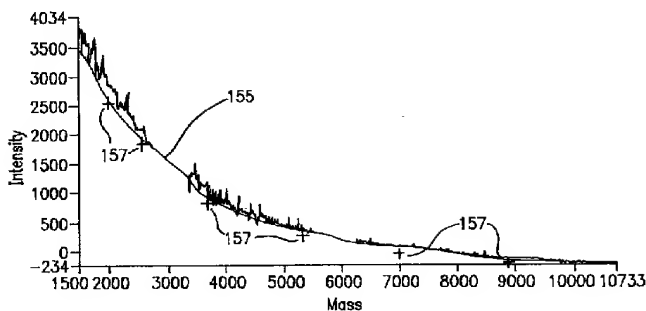


FIG. 37

FIND MINIMA IN REMAINING SIGNALS AND CONNECT TO FORM A PEAK FREE SIGNAL

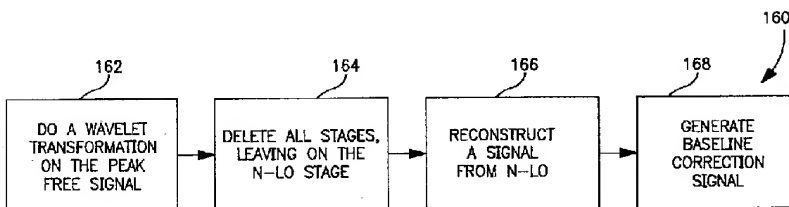


FIG. 38

GENRATE BASLELINE CORRECTION

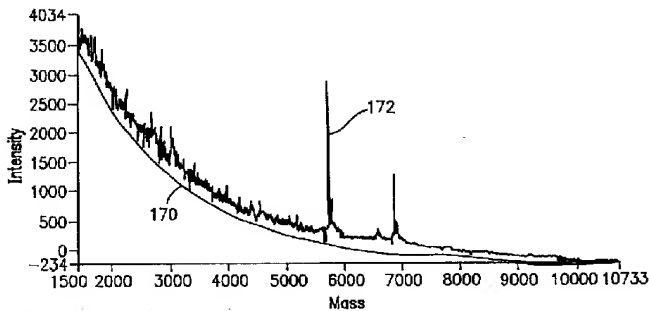


FIG. 39

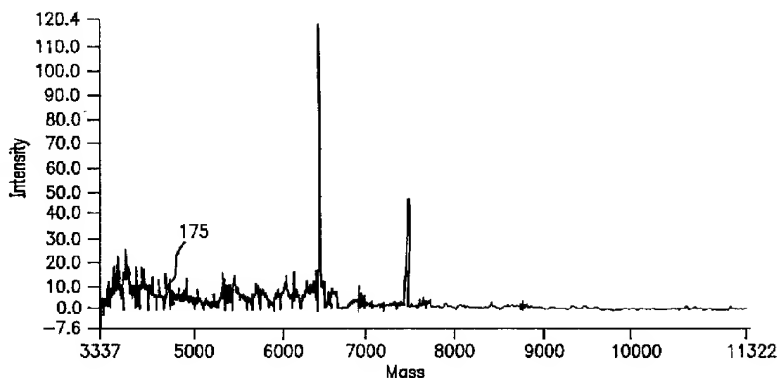


FIG. 40

NON-0 COEFFICIENTS		COEFFICIENTS		INTERMEDIATE		RELATIVE	
183	100	25	182	100.025	186	100.025	180
	150	220	184	150.220	188	50.220	195
	500	.1		500.0001	190	350.0001	
	10,050	800		10,050.8		9550.8	
	10,075	890		10,075.89		25.89	
	11,125	910		11,125.91		150.91	
	12,100	1000 (MAX)		12,100.99999		975.99999	
	13,250	940		13,250.94		1150.94	

FIG. 41

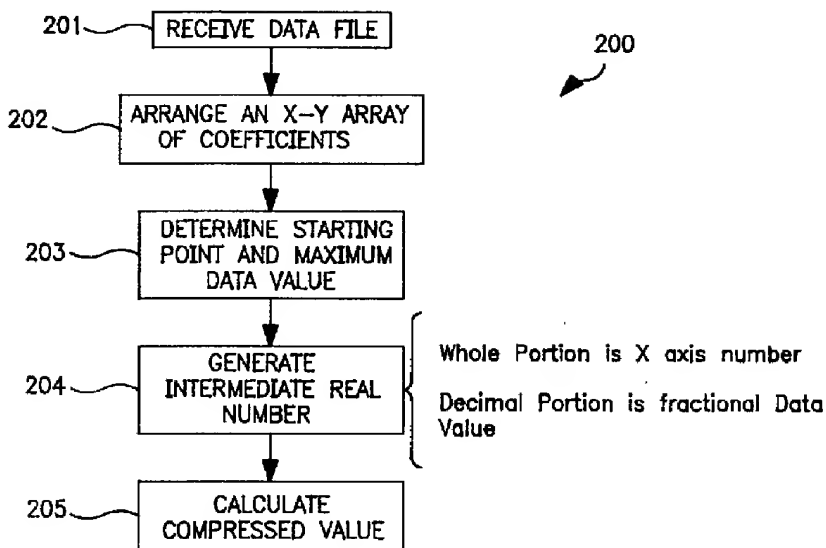


FIG. 42

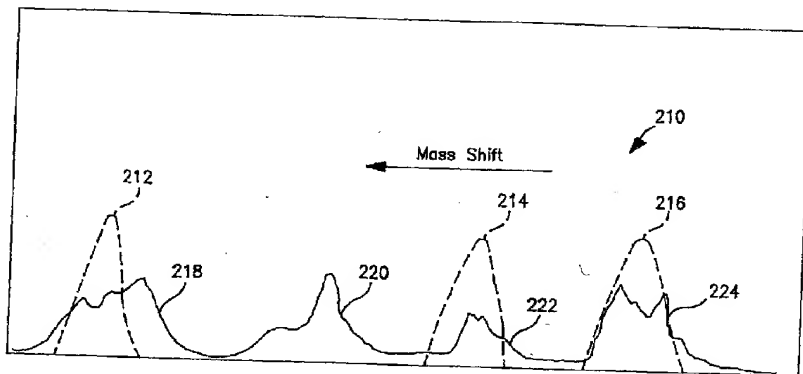


FIG. 43

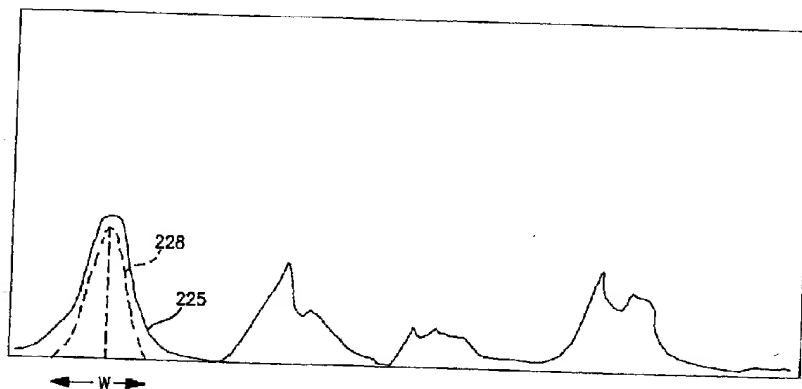


FIG. 44

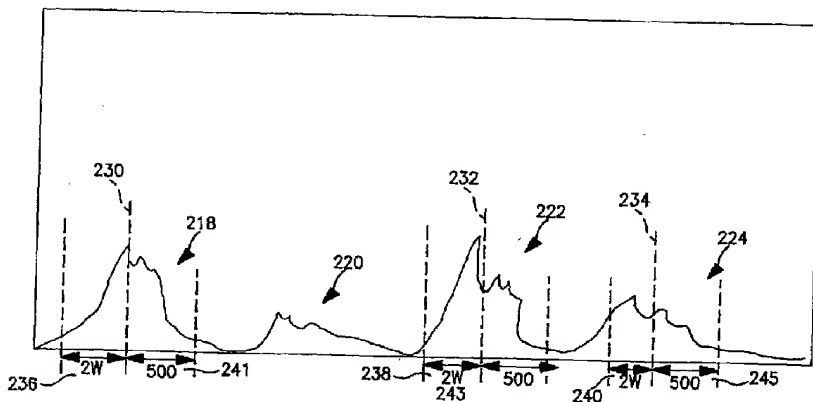


FIG. 45

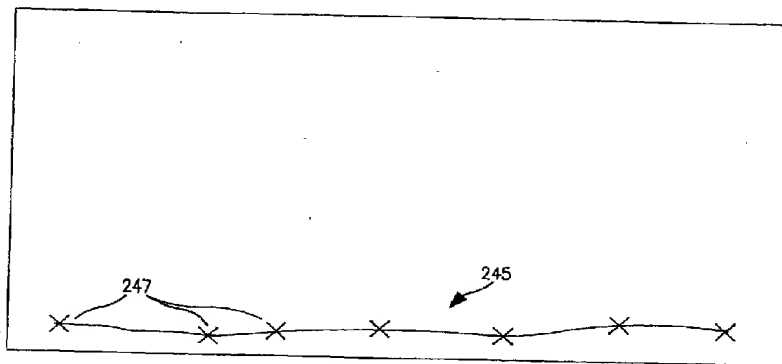


FIG. 46

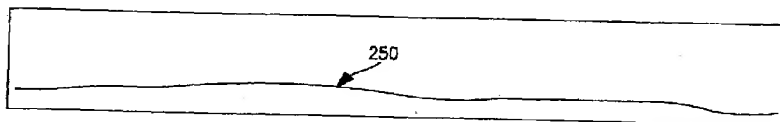


FIG. 47

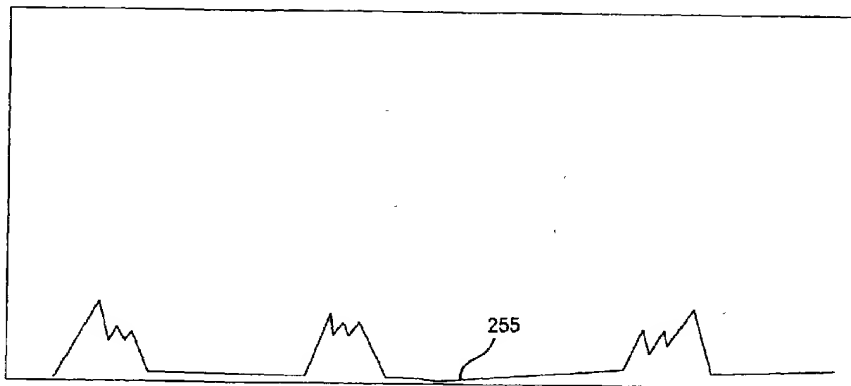


FIG. 48

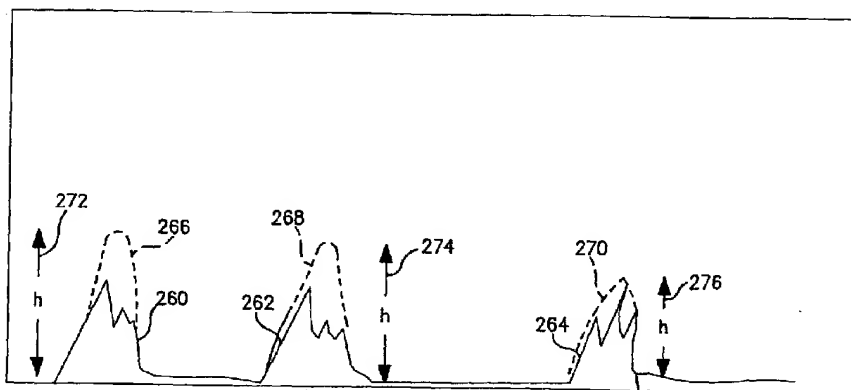


FIG. 49

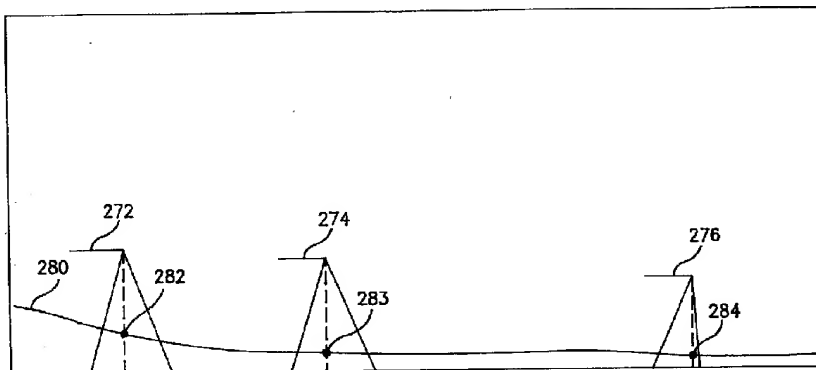


FIG. 50

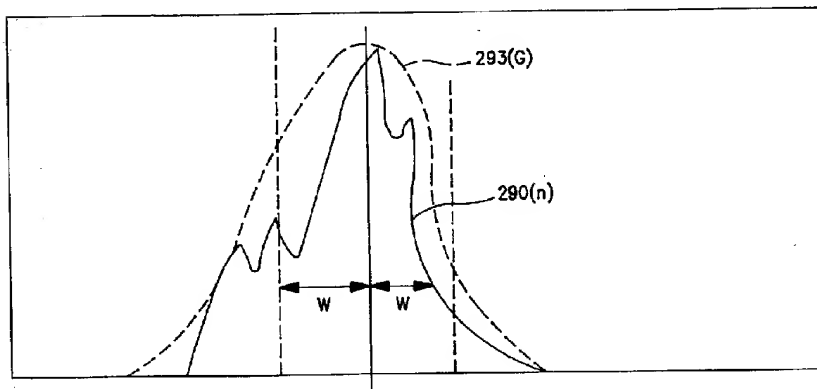


FIG. 51

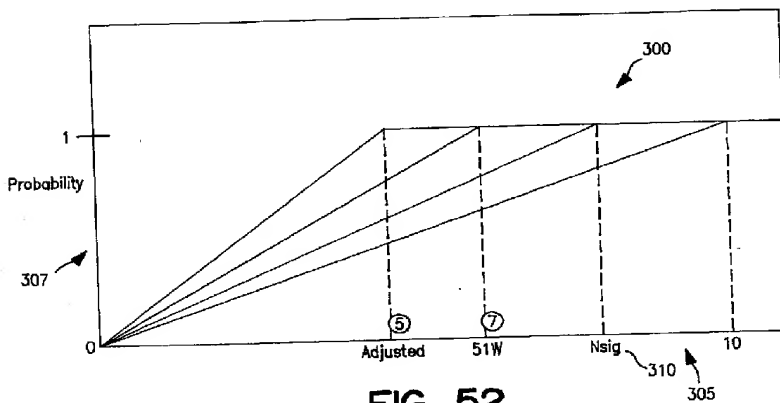


FIG. 52

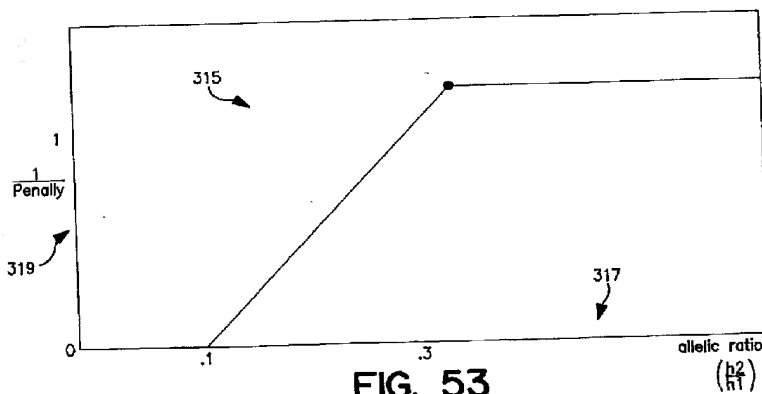


FIG. 53

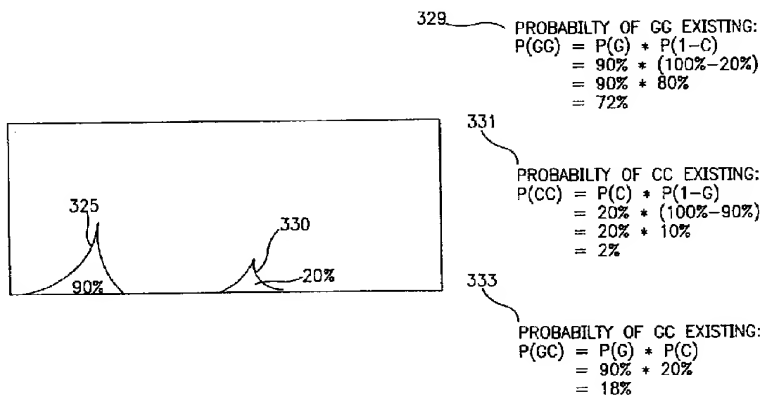


FIG. 54

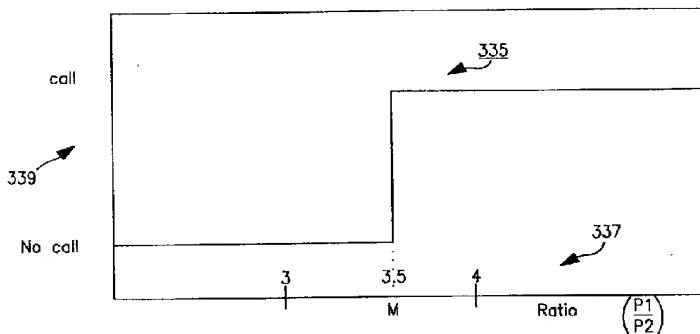
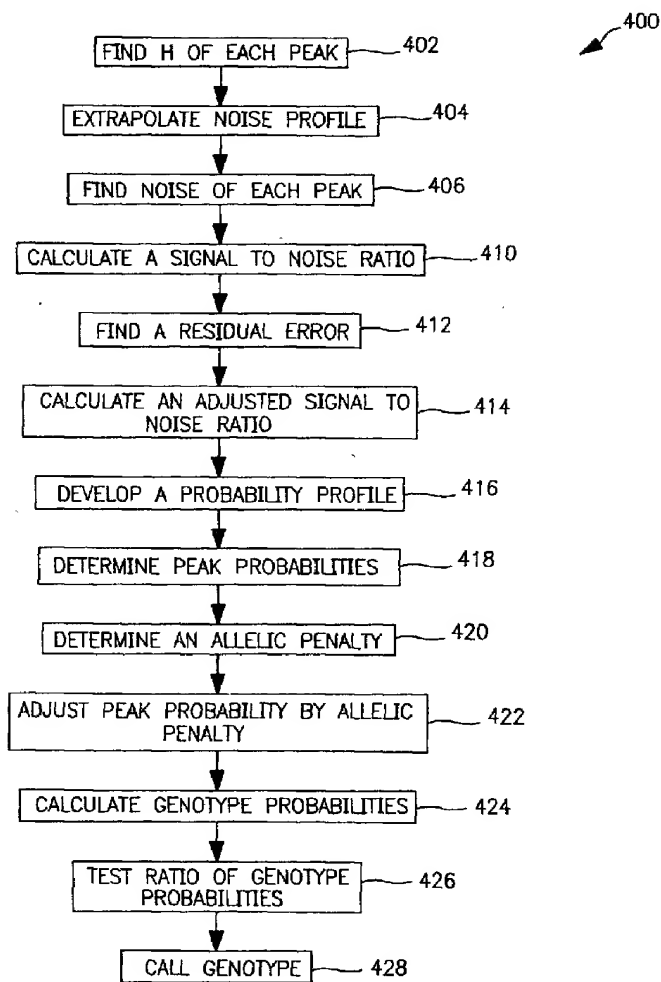


FIG. 55



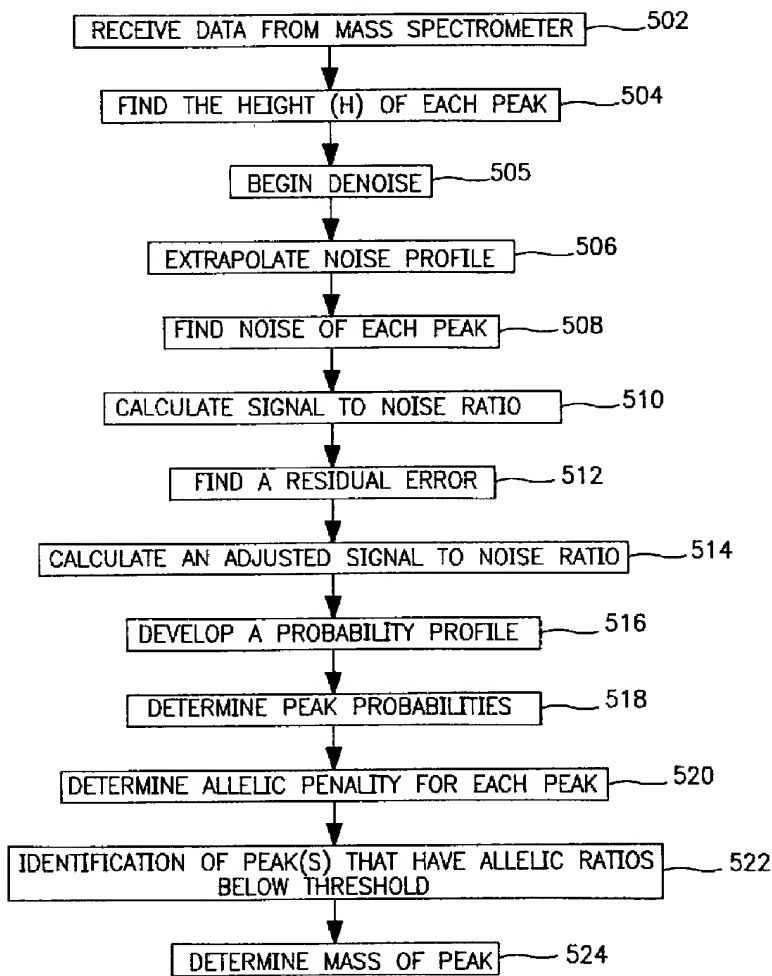


FIG. 57

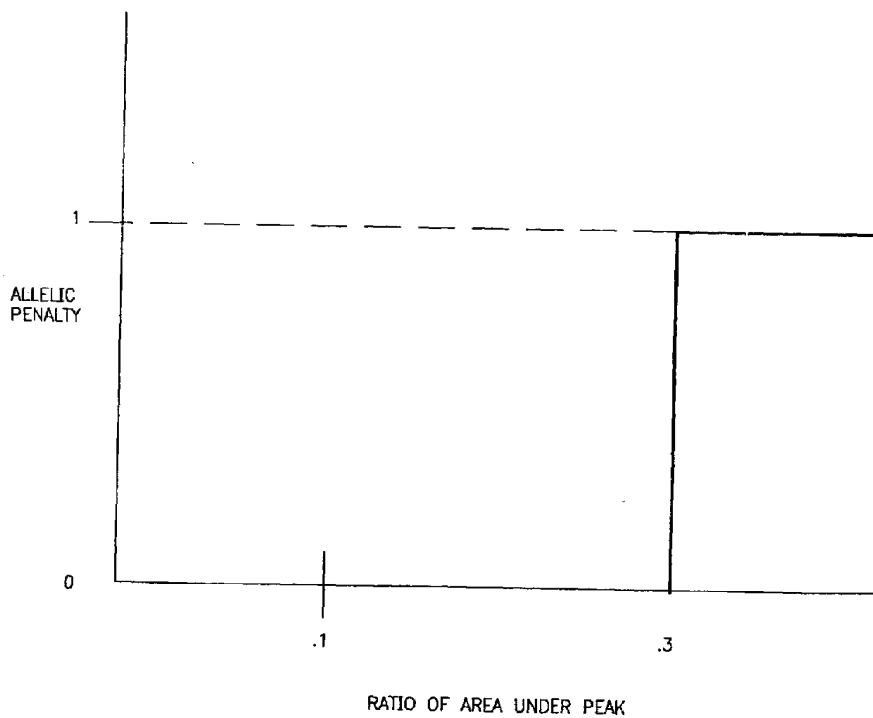


FIG. 58

METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS

RELATED APPLICATIONS

[0001] This application is a divisional application of copending U.S. patent application Ser. No. 09/687,483, filed Oct. 13, 2000, to Andreas Braun, Hubert Koster, Dirk Van den Boom, Yip Ping, Charles Rodi, Liyan He, Norman Chiu and Christian Jurinke entitled "METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS."

[0002] Benefit of priority under 35 U.S.C. § 119(e) to the following provisional applications is claimed herein:

[0003] U.S. provisional application Serial No. 60/217,658 to Andreas Braun, Hubert Koster; Dirk Van den Boom, filed Jul. 10, 2000, entitled "METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS"; U.S. provisional application Serial No. 60/159,176 to Andreas Braun, Hubert Koster, Dirk Van den Boom, filed Oct. 13, 1999, entitled "METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS"; U.S. provisional application Serial No. 60/217,251, filed Jul. 10, 2000, to Andreas Braun, entitled "POLYMORPHIC KINASE ANCHOR PROTEIN GENE SEQUENCES, POLYMORPHIC KINASE ANCHOR PROTEINS AND METHODS OF DETECTING POLYMORPHIC KINASE ANCHOR PROTEINS AND NUCLEIC ACIDS ENCODING THE SAME". This application is also a continuation-in-part of U.S. application Ser. No. 09/663,968, to Ping Yip, filed Sep. 19, 2000, entitled "METHOD AND DEVICE FOR IDENTIFYING A BIOLOGICAL SAMPLE."

[0004] The above-noted applications and provisional applications are incorporated by reference in their entirety.

FIELD OF THE INVENTION

[0005] Process and methods for creating a database of genomic samples from healthy human donors. Methods that use the database to identify and correlate with polymorphic genetic markers and other markers with diseases and conditions are provided.

BACKGROUND

[0006] Diseases in all organisms have a genetic component, whether inherited or resulting from the body's response to environmental stresses, such as viruses and toxins. The ultimate goal of ongoing genomic research is to use this information to develop new ways to identify, treat and potentially cure these diseases. The first step has been to screen disease tissue and identify genomic changes at the level of individual samples. The identification of these "disease" markers has then fueled the development and commercialization of diagnostic tests that detect these errant genes or polymorphisms. With the increasing numbers of genetic markers, including single nucleotide polymorphisms (SNPs), microsatellites, tandem repeats, newly mapped introns and exons, the challenge to the medical and pharmaceutical communities is to identify genotypes which not only identify the disease but also follow the progression of the disease and are predictive of an organism's response to treatment.

[0007] Currently the pharmaceutical and biotechnology industries find a disease and then attempt to determine the genomic basis for the disease. This approach is time consuming and expensive and in many cases involves the investigator guessing as to what pathways might be involved in the disease.

[0008] Genomics

[0009] Presently the two main strategies employed in analyzing the available genomic information are the technology driven reverse genetics brute force strategy and the knowledge-based pathway oriented forward genetics strategy. The brute force approach yields large databases of sequence information but little information about the medical or other uses of the sequence information. Hence this strategy yields intangible products of questionable value. The knowledge-based strategy yields small databases that contain a lot of information about medical uses of particular DNA sequences and other products in the pathway and yield tangible products with a high value.

[0010] Polymorphisms

[0011] Polymorphisms have been known since 1901 with the identification of blood types. In the 1950's they were identified on the level of proteins using large population genetic studies. In the 1980's and 1990's many of the known protein polymorphisms were correlated with genetic loci on genomic DNA. For example, the gene dose of the apolipoprotein E type 4 allele was correlated with the risk of Alzheimer's disease in late onset families (see, e.g., Corder et al. (1993) *Science* 261: 921-923; mutation in blood coagulation factor V was associated with resistance to activated protein C (see, e.g., Bertina et al. (1994) *Nature* 369:64-67); resistance to HIV-1 infection has been shown in Caucasian individuals bearing mutant alleles of the CCR-5 chemokine receptor gene (see, e.g., Samson et al. (1996) *Nature* 382:722-725); and a hypermutable tract in antigen presenting cells (APC, such as macrophages), has been identified in familial colorectal cancer in individuals of Ashkenzi jewish background (see, e.g., Laken et al. (1997) *Nature Genet.* 17:79-83). There can be more than three million polymorphic sites in the human genome. Many have been identified, but not yet characterized or mapped or associated with a marker.

[0012] Single Nucleotide Polymorphisms (SNPs)

[0013] Much of the focus of genomics has been in the identification of SNPs, which are important for a variety of reasons. They allow indirect testing (association of haplotypes) and direct testing (functional variants). They are the most abundant and stable genetic markers. Common diseases are best explained by common genetic alterations, and the natural variation in the human population aids in understanding disease, therapy and environmental interactions.

[0014] Currently, the only available method to identify SNPs in DNA is by sequencing, which is expensive, difficult and laborious. Furthermore, once a SNP is discovered it must be validated to determine if it is a real polymorphism and not a sequencing error. Also, discovered SNPs must then be evaluated to determine if they are associated with a particular phenotype. Thus, there is a need to develop new paradigms for identifying the genomic basis for disease and markers thereof. Therefore, it is an object herein to provide methods for identifying the genomic basis of disease and markers thereof.

SUMMARY

[0015] Databases and methods using the databases are provided herein. The databases comprise sets of parameters associated with subjects in populations selected only on the basis of being healthy (i.e., where the subjects are mammals, such as humans, they are selected based upon apparent health and no detectable infections). The databases can be sorted based upon one or more of the selected parameters.

[0016] The databases, for example, can be relational databases, in which an index that represents each subject serves to relate parameters, which are the data, such as age, ethnicity, sex, medical history, etc. and ultimately genotypic information, that was inputted into and stored in the database. The database can then be sorted according to these parameters. Initially, the parameter information is obtained from a questionnaire answered by each subject from whom a body tissue or body fluid sample is obtained. As additional information about each sample is obtained, this information can be entered into the database and can serve as a sorting parameter.

[0017] The databases obtained from healthy individuals have numerous uses, such as correlating known polymorphisms with a phenotype or disease. The databases can be used to identify alleles that are deleterious, that are beneficial, and that are correlated with diseases.

[0018] For purposes herein, genotypic information can be obtained by any method known to those of skill in the art, but is generally obtained using mass spectrometry.

[0019] Also provided herein, is a new use for existing databases of subjects and genotypic and other parameters, such as age, ethnicity, race, and gender. Any database can be sorted according to the methods herein, and alleles that exhibit statistically significant correlations with any of the sorting parameters can be identified. It is noted, however, is noted, that the databases provided herein and randomly selected databases will perform better in these methods, since disease-based databases suffer numerous limitations, including their relatively small size, the homogeneity of the selected disease population, and the masking effect of the polymorphism associated with the markers for which the database was selected. Hence, the healthy database provided herein, provides advantages not heretofore recognized or exploited. The methods provided herein can be used with a selected database, including disease-based databases, with or without sorting for the discovery and correlation of polymorphisms. In addition, the databases provided herein represent a greater genetic diversity than the unselected databases typically utilized for the discovery of polymorphisms and thus allow for the enhanced discovery and correlation of polymorphisms.

[0020] The databases provided herein can be used for taking an identified polymorphism and ascertaining whether it changes in frequency when the data are sorted according to a selected parameter.

[0021] One use of these methods is correlating a selected marker with a particular parameter by following the occurrence of known genetic markers and then, having made this correlation, determining or identifying correlations with diseases. Examples of this use are p53 and Lipoprotein Lipase polymorphism. As exemplified herein, known markers are shown to have particular correlation with certain

groups, such as a particular ethnicity or race or one sex. Such correlations will then permit development of better diagnostic tests and treatment regimens.

[0022] These methods are valuable for identifying one or more genetic markers whose frequency changes within the population as a function of age, ethnic group, sex or some other criteria. This can allow the identification of previously unknown polymorphisms and ultimately a gene or pathway involved in the onset and progression of disease.

[0023] The databases and methods provided herein permit, among other things, identification of components, particularly key components, of a disease process by understanding its genetic underpinnings and also permit an understanding of processes, such as individual drug responses. The databases and methods provided herein also can be used in methods involving elucidation of pathological pathways, in developing new diagnostic assays, identifying new potential drug targets, and in identifying new drug candidates.

[0024] The methods and databases can be used with experimental procedures, including, but are not limited to, in silico SNP identification, in vitro SNP identification/verification, genetic profiling of large populations, and in biostatistical analyses and interpretations.

[0025] Also provided herein, are combinations that contain a database provided herein and a biological sample from a subject in the database, and typically biological samples from all subjects or a plurality of subjects in the database. Collections of the tissue and body fluid samples are also provided.

[0026] Also, provided herein, are methods for determining a genetic marker that correlates with age, comprising identifying a polymorphism and determining the frequency of the polymorphism with increasing age in a healthy population.

[0027] Further provided herein are methods for determining whether a genetic marker correlates with susceptibility to morbidity, early mortality, or morbidity and early mortality, comprising identifying a polymorphism and determining the frequency of the polymorphism with increasing age in a healthy population.

[0028] Any of the methods herein described can be used out in a multiplex format.

[0029] Also provided are an apparatus and process for accurately identifying genetic information. It is another object herein that genetic information be extracted from genetic data in a highly automated manner. Therefore, to overcome the deficiencies in the known conventional systems, methods and apparatus for identifying a biological sample are provided.

[0030] Briefly, the method and system for identifying a biological sample generates a data set indicative of the composition of the biological sample. In a particular example, the data set is DNA spectrometry data received from a mass spectrometer. The data set is denoised, and a baseline is deleted. Since possible compositions of the biological sample can be known, expected peak areas can be determined. Using the expected peak areas, a residual baseline is generated to further correct the data set. Probable peaks are then identifiable in the corrected data set, which are used to identify the composition of the biological

sample. In a disclosed example, statistical methods are employed to determine the probability that a probable peak is an actual peak, not an actual peak, or that the data too inconclusive to call.

[0031] Advantageously, the method and system for identifying a biological sample accurately makes composition calls in a highly automated manner. In such a manner, complete SNP profile information, for example, can be collected efficiently. More importantly, the collected data are analyzed with highly accurate results. For example, when a particular composition is called, the result can be relied upon with great confidence. Such confidence is provided by the robust computational process employed

DESCRIPTION OF THE DRAWINGS

[0032] FIG. 1 depicts an exemplary sample bank. Panel 1 shows the samples as a function of sex and ethnicity. Panel 2 shows the Caucasians as a function of age. Panel 3 shows the Hispanics as a function of age.

[0033] FIGS. 2A and 2C show an age- and sex-distribution of the 291S allele of the lipoprotein lipase gene in which a total of 436 males and 589 females were investigated. FIG. 2B shows an age distribution for the 436 males.

[0034] FIG. 3 is an exemplary questionnaire for population-based sample banking.

[0035] FIG. 4 depicts processing and tracking of blood sample components.

[0036] FIG. 5 depicts the allelic frequency of "sick" alleles and "healthy" alleles as a function of age. It is noted that the relative frequency of healthy alleles increases in a population with increasing age.

[0037] FIG. 6 depicts the age-dependent distribution of ApoE genotypes (see, Schächter et al. (1994) *Nature Genetics* 6:29-32).

[0038] FIG. 7A-D depicts age-related and genotype frequency of the p53 (tumor suppressor) codon 72 among the Caucasian population in the database. *R72 and *P72 represent the frequency of the allele in the database population. R72, R72P, and P72 represent the genotypes of the individuals in the population. The frequency of the homozygous P72 allele drops from 6.7% to 3.7% with age.

[0039] FIG. 8 depicts the allele and genotype frequencies of the p21 S31R allele as a function of age.

[0040] FIG. 9 depicts the frequency of the FVII AAllele 353Q in pooled versus individual samples.

[0041] FIG. 10 depicts the frequency of the CETP (cholesterol ester transfer protein) allele in pooled versus individual samples.

[0042] FIG. 11 depicts the frequency of the plasminogen activator inhibitor-1 (PAI-1) 5G in pooled versus individual samples.

[0043] FIG. 12 shows mass spectra of the samples and the ethnic diversity of the PAI-1 alleles.

[0044] FIG. 13 shows mass spectra of the samples and the ethnic diversity of the CETP 405 alleles.

[0045] FIG. 14 shows mass spectra of the samples and the ethnic diversity of the Factor VII 353 alleles.

[0046] FIG. 15 shows ethnic diversity of PAI-1, CETP and Factor VII using the pooled DNA samples.

[0047] FIG. 16 shows the p53-Rb pathway and the relationships among the various factors in the pathway.

[0048] FIG. 17, which is a block diagram of a computer constructed to provide and process the databases described herein, depicts a typical computer system for storing and sorting the databases provided herein and practicing the methods provided herein.

[0049] FIG. 18 is a flow diagram that illustrates the processing steps performed using the computer illustrated in FIG. 17, to maintain and provide access to the databases for identifying polymorphic genetic markers.

[0050] FIG. 19 is a histogram showing the allele and genotype distribution in the age and sex stratified Caucasian population for the AKAP10-1 locus. Bright green bars show frequencies in individuals younger than 40 years. Dark green bars show frequencies in individuals older than 60 years.

[0051] FIG. 20 is a histogram showing the allele and genotype distribution in the age and sex stratified Caucasian population for the AKAP10-5 locus. Bright green bars show frequencies in individuals younger than 40 years; dark green bars show frequencies in individuals older than 60 years.

[0052] FIG. 21 is a histogram showing the allele and genotype distribution in the age and sex stratified Caucasian population for the h-msrA locus. Genotype difference between male age groups is significant. Bright green bars show frequencies in individuals younger than 40 years. Dark green bars show frequencies in individuals older than 60 years.

[0053] FIG. 22A-D is a sample data collection questionnaire used for the healthy database.

[0054] FIG. 23 is a flowchart showing processing performed by the computing device of FIG. 24 when performing genotyping of sense strands and antisense strands from assay fragments.

[0055] FIG. 24 is a block diagram showing a system provided herein;

[0056] FIG. 25 is a flowchart of a method of identifying a biological sample provided herein;

[0057] FIG. 26 is a graphical representation of data from a mass spectrometer;

[0058] FIG. 27 is a diagram of wavelet transformation of mass spectrometry data;

[0059] FIG. 28 is a graphical representation of wavelet stage 0 hi data;

[0060] FIG. 29 is a graphical representation of stage 0 noise profile;

[0061] FIG. 30 is a graphical representation of generating stage noise standard deviations;

[0062] FIG. 31 is a graphical representation of applying a threshold to data stages;

[0063] FIG. 32 is a graphical representation of a sparse data set;

[0064] FIG. 33 is a formula for signal shifting;

[0065] FIG. 34 is a graphical representation of a wavelet transformation of a denoised and shifted signal;

[0066] FIG. 35 is a graphical representation of a denoised and shifted signal;

[0067] FIG. 36 is a graphical representation of removing peak sections;

[0068] FIG. 37 is a graphical representation of generating a peak free signal;

[0069] FIG. 38 is a block diagram of a method of generating a baseline correction;

[0070] FIG. 39 is a graphical representation of a baseline and signal;

[0071] FIG. 40 is a graphical representation of a signal with baseline removed;

[0072] FIG. 41 is a table showing compressed data;

[0073] FIG. 42 is a flowchart of method for compressing data;

[0074] FIG. 43 is a graphical representation of mass shifting;

[0075] FIG. 44 is a graphical representation of determining peak width;

[0076] FIG. 45 is a graphical representation of removing peaks;

[0077] FIG. 46 is a graphical representation of a signal with peaks removed;

[0078] FIG. 47 is a graphical representation of a residual baseline;

[0079] FIG. 48 is a graphical representation of a signal with residual baseline removed;

[0080] FIG. 49 is a graphical representation of determining peak height;

[0081] FIG. 50 is a graphical representation of determining signal-to-noise for each peak;

[0082] FIG. 51 is a graphical representation of determining a residual error for each peak;

[0083] FIG. 52 is a graphical representation of peak probabilities;

[0084] FIG. 53 is a graphical representation of applying an allelic ratio to peak probability;

[0085] FIG. 54 is a graphical representation of determining peak probability;

[0086] FIG. 55 is a graphical representation of calling a genotype;

[0087] FIG. 56 is a flowchart showing a statistical procedure for calling a genotype;

[0088] FIG. 57 is a flowchart showing processing performed by the computing device of FIG. 1 when performing standardless genotyping; and

[0089] FIG. 58 is graphical representation of applying an allelic ratio to peak probability for standardless genotype processing.

DETAILED DESCRIPTION

[0090] Definitions

[0091] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as is commonly understood by one of ordinary skill in the art to which this invention belongs. All patents, applications, published applications and other publications and sequences from GenBank and other databases referred to herein throughout the disclosure are incorporated by reference in their entirety.

[0092] As used herein, a biopolymer includes, but is not limited to, nucleic acid, proteins, polysaccharides, lipids and other macromolecules. Nucleic acids include DNA, RNA, and fragments thereof. Nucleic acids can be derived from genomic DNA, RNA, mitochondrial nucleic acid, chloroplast nucleic acid and other organelles with separate genetic material.

[0093] As used herein, morbidity refers to conditions, such as diseases or disorders, that compromise the health and well-being of an organism, such as an animal. Morbidity susceptibility or morbidity-associated genes are genes that, when altered, for example, by a variation in nucleotide sequence, facilitate the expression of a specific disease clinical phenotype. Thus, morbidity susceptibility genes have the potential, upon alteration, of increasing the likelihood or general risk that an organism will develop a specific disease.

[0094] As used herein, mortality refers to the statistical likelihood that an organism, particularly an animal, will not survive a full predicted lifespan. Hence, a trait or a marker, such as a polymorphism, associated with increased mortality is observed at a lower frequency in older than younger segments of a population.

[0095] As used herein, a polymorphism, e.g. genetic variation, refers to a variation in the sequence of a gene in the genome amongst a population, such as allelic variations and other variations that arise or are observed. Thus, a polymorphism refers to the occurrence of two or more genetically determined alternative sequences or alleles in a population. These differences can occur in coding and non-coding portions of the genome, and can be manifested or detected as differences in nucleic acid sequences, gene expression, including, for example transcription, processing, translation, transport, protein processing, trafficking, DNA synthesis, expressed proteins, other gene products or products of biochemical pathways or in post-translational modifications and any other differences manifested amongst members of a population. A single nucleotide polymorphism (SNP) refers to a polymorphism that arises as the result of a single base change, such as an insertion, deletion or change in a base.

[0096] A polymorphic marker or site is the locus at which divergence occurs. Such site can be as small as one base pair (an SNP). Polymorphic markers include, but are not limited to, restriction fragment length polymorphisms, variable number of tandem repeats (VNTR's), hypervariable regions, minisatellites, dinucleotide repeats, trinucleotide repeats, tetranucleotide repeats and other repeating patterns, simple sequence repeats and insertional elements, such as Alu. Polymorphic forms also are manifested as different mendelian alleles for a gene. Polymorphisms can be observed by differences in proteins, protein modifications, RNA expression modification, DNA and RNA methylation, regulatory

factors that alter gene expression and DNA replication, and any other manifestation of alterations in genomic nucleic acid or organelle nucleic acids.

[0097] As used herein, a healthy population refers to a population of organisms, including but are not limited to, animals, bacteria, viruses, parasites, plants, eubacteria, and others, that are disease free. The concept of disease-free is a function of the selected organism. For example, for mammals it refers to a subject not manifesting any disease state. Practically a healthy subject, when human, is defined as human donor who passes blood bank criteria to donate blood for eventual use in the general population. These criteria are as follows: free of detectable viral, bacterial, mycoplasma, and parasitic infections; not anemic; and then further selected based upon a questionnaire regarding history (see FIG. 3). Thus, a healthy population represents an unbiased population of sufficient health to donate blood according to blood bank criteria, and not further selected for any disease state. Typically such individuals are not taking any medications. For plants, for example, it is a plant population that does not manifest diseases pathology associated with plants. For bacteria it is a bacterial population replicating without environmental stress, such as selective agents, heat and other pathogens.

[0098] As used herein, a healthy database (or healthy patient database) refers to a database of profiles of subjects that have not been pre-selected for any particular disease. Hence, the subjects that serve as the source of data for the database are selected, according to predetermined criteria, to be healthy. In contrast to other such databases that have been pre-selected for subjects with a particular disease or other characteristic, the subjects for the database provided herein are not so-selected. Also, if the subjects do manifest a disease or other condition, any polymorphism discovered or characterized should be related to an independent disease or condition. In a one embodiment, where the subjects are human, a healthy subject manifests no disease symptoms and meets criteria, such as those set by blood banks for blood donors.

[0099] Thus, the subjects for the database are a population of any organism, including, but are not limited to, animals, plants, bacteria, viruses, parasites and any other organism or entity that has nucleic acid. Among subjects are mammals, such as, although not necessarily, humans. Such a database can capture the diversity of a population, thus providing for discovery of rare polymorphisms.

[0100] As used herein, a profile refers to information relating to, but not limited to and not necessarily including all of, age, sex, ethnicity, disease history, family history, phenotypic characteristics, such as height and weight and other relevant parameters. A sample collect information form is shown in FIG. 22, which illustrates profile intent.

[0101] As used herein, a disease state is a condition or abnormality or disorder that can be inherited or result from environmental stresses, such as toxins, bacterial, fungal and viral infections.

[0102] As used herein, set of non-selected subjects means that the subjects have not been pre-selected to share a common disease or other characteristic. They can be selected to be healthy as defined herein.

[0103] As used herein, a phenotype refers to a set of parameters that includes any distinguishable trait of an

organism. A phenotype can be physical traits and can be, in instances in which the subject is an animal, a mental trait, such as emotional traits. Some phenotypes can be determined by observation elicited by questionnaires (see, e.g., FIGS. 3 and 22) or by referring to prior medical and other records. For purposes herein, a phenotype is a parameter around which the database can be sorted.

[0104] As used herein, a parameter is any input data that will serve as a basis for sorting the database. These parameters will include phenotypic traits, medical histories, family histories and any other such information elicited from a subject or observed about the subject. A parameter can describe the subject, some historical or current environmental or social influence experienced by the subject, or a condition or environmental influence on someone related to the subject. Parameters include, but are not limited to, any of those described herein, and known to those of skill in the art.

[0105] As used herein, haplotype refers to two or polymorphism located on a single DNA strand. Hence, haplotyping refers to identification of two or more polymorphisms on a single DNA strand. Haplotypes can be indicative of a phenotype. For some disorders a single polymorphism can suffice to indicate a trait; for others a plurality (i.e., a haplotype) can be needed. Haplotyping can be performed by isolating nucleic acid and separating the strands. In addition, when using enzymes such as certain nucleases, that produce, different size fragments from each strand, strand separation is not needed for haplotyping.

[0106] As used herein, pattern with reference to a mass spectrum or mass spectrometric analyses, refers to a characteristic distribution and number of signals (such peaks or digital representations thereof).

[0107] As used herein, signal in the context of a mass spectrum and analysis thereof refers to the output data, which the number or relative number of molecules having a particular mass. Signals include "peaks" and digital representations thereof.

[0108] As used herein, adaptor, when used with reference to haplotyping using Fen ligase, refers to a nucleic acid that specifically hybridizes to a polymorphism of interest. An adaptor can be partially double-stranded. An adaptor complex is formed when an adaptor hybridizes to its target.

[0109] As used herein, a target nucleic acid refers to any nucleic acid of interest in a sample. It can contain one or more nucleotides.

[0110] As used herein, standardless analysis refers to a determination based upon an internal standard. For example, the frequency of a polymorphism can be determined herein by comparing signals within a single mass spectrum.

[0111] As used herein, amplifying refers to methods for increasing the amount of a bipolymer, especially nucleic acids. Based on the 5' and 3' primers that are chosen, amplification also serves to restrict and define the region of the genome which is subject to analysis. Amplification can be performed by any method known to those skilled in the art, including use of the polymerase chain reaction (PCR) etc. Amplification, e.g., PCR must be done quantitatively when the frequency of polymorphism is required to be determined.

[0112] As used herein, cleaving refers to non-specific and specific fragmentation of a biopolymer.

[0113] As used herein, multiplexing refers to the simultaneous detection of more than one polymorphism. Methods for performing multiplexed reactions, particularly in conjunction with mass spectrometry are known (see, e.g., U.S. Pat. Nos. 6,043,031, 5,547,835 and International PCT application No. WO 97/37041).

[0114] As used herein, reference to mass spectrometry encompasses any suitable mass spectrometric format known to those of skill in the art. Such formats include, but are not limited to, Matrix-Assisted Laser Desorption/Ionization, Time-of-Flight (MALDI-TOF), Electrospray (ES), IR-MALDI (see, e.g., published International PCT application No.99/57318 and U.S. Pat. No. 5,118,937), Ion Cyclotron Resonance (ICR), Fourier Transform and combinations thereof. MALDI, particular UV and IR, are among the formats contemplated.

[0115] As used herein, mass spectrum refers to the presentation of data obtained from analyzing a biopolymer or fragment thereof by mass spectrometry either graphically or encoded numerically.

[0116] As used herein, a blood component is a component that is separated from blood and includes, but is not limited to red blood cells and platelets, blood clotting factors, plasma, enzymes, plasminogen, immunoglobulins. A cellular blood component is a component of blood, such as a red blood cell, that is a cell. A blood protein is a protein that is normally found in blood. Examples of such proteins are blood factors VII and VII. Such proteins and components are well-known to those of skill in the art.

[0117] As used herein, plasma can be prepared by any method known to those of skill in the art. For example, it can be prepared by centrifuging blood at a force that pellets the red cells and forms an interface between the red cells and the buffy coat, which contains leukocytes, above which is the plasma. For example, typical platelet concentrates contain at least about 10% plasma.

[0118] Blood can be separated into its components, including, but not limited to, plasma, platelets and red blood cells by any method known to those of skill in the art. For example, blood can be centrifuged for a sufficient time and at a sufficient acceleration to form a pellet containing the red blood cells. Leukocytes collect primarily at the interface of the pellet and supernatant in the buffy coat region. The supernatant, which contains plasma, platelets, and other blood components, can then be removed and centrifuged at a higher acceleration, whereby the platelets pellet.

[0119] As used herein, p53 is a cell cycle control protein that assesses DNA damage and acts as a transcription factor regulation gene which control cell growth, DNA repair and apoptosis. The p53 mutations have been found in a wide variety of different cancers, including all of the different types of leukemia, with varying frequency. The loss of normal p53 functions results in genomic instability and uncontrolled growth of the host cell.

[0120] As used herein, p21 is a cyclin-dependent kinase inhibitor, associated with G1 phase arrest of normal cells. Expression triggers apoptosis or programmed cell death and has been associated with Wilms' tumor, a pediatric kidney cancer.

[0121] As used herein, Factor VII is a serine protease involved the extrinsic blood coagulation cascade. This factor is activated by thrombin and works with tissue factor (Factor III) in the processing of Factor X to Factor Xa. Evidence has supported an association between polymorphisms in the gene and increase Factor VII activity which can result in an elevated risk of ischemic cardiovascular disease including myocardial infarction.

[0122] As used herein, a relational database stores information in a form representative of matrices, such as two-dimensional tables, including rows and columns of data, or higher dimensional matrices. For example, in one embodiment, the relational database has separate tables each with a parameter. The tables are linked with a record number, which also acts as an index. The database can be searched or sorted by using data in the tables and is stored in any suitable storage medium, such as floppy disk, CD rom disk, hard drive or other suitable medium.

[0123] As used herein, a bar codes refers any array of optically readable marks of any desired size and shape that are arranged in a reference context or frame of, typically, although not necessarily, one or more columns and one or more rows. For purposes herein, the bar code refers to any symbology, not necessary "bar" but can include dots, characters or any symbol or symbols.

[0124] As used herein, symbology refers to an identifier code or symbol, such as a bar code, that is linked to a sample. The index will reference each such symbology. The symbology is any code known or designed by the user. The symbols are associated with information stored in the database. For example, each sample can be uniquely identified with an encoded symbology. The parameters, such as the answers to the questions and subsequent genotypic and other information obtained upon analysis of the samples is included in the database and associated with the symbology. The database is stored on any suitable recording medium, such as a hard drive, a floppy disk, a tape, a CD ROM, a DVD disk and any other suitable medium.

[0125] Databases

[0126] Human genotyping is currently dependent on collaborations with hospitals, tissues banks and research institutions that provide samples of disease tissue. This approach is based on the concept that the onset and/or progression of diseases can be correlated with the presence of a polymorphisms or other genetic markers. This approach does not consider that disease correlated with the presence of specific markers and the absence of specific markers. It is shown herein that identification and scoring of the appearance and disappearance of markers is possible only if these markers are measured in the background of healthy subjects where the onset of disease does not mask the change in polymorphism occurrence. Databases of information from disease populations suffer from small sample size, selection bias and heterogeneity. The databases provided herein from healthy populations solve these problems by permitting large sample bands, simple selection methods and diluted heterogeneity.

[0127] Provided herein are first databases of parameters, associated with non-selected, particularly healthy, subjects. Also provided are combinations of the databases with indexed samples obtained from each of the subjects. Further provided are databases produced from the first databases.

These contain, in addition to the original parameters, information, such as genotypic information, including, but are not limited to, genomic sequence information, derived from the samples.

[0128] The databases, which are herein designated healthy databases, are so-designated because they are not obtained from subjects pre-selected for a particular disease. Hence, although individual members can have a disease, the collection of individuals is not selected to have a particular disease.

[0129] The subjects from whom the parameters are obtained comprise either a set of subjects who are randomly selected across, typically, all populations, or are pre-selected to be disease-free or healthy. As a result, the database is not selected to be representative of any pre-selected phenotype, genotype, disease or other characteristic. Typically the number of subjects from which the database is prepared is selected to produce statistically significant results when used in the methods provided herein. Generally, the number of subjects will be greater than 100, 200, and typically than 1000. The precise number can be empirically determined based upon the frequency of the parameter(s) that can be used to sort the database. Generally the population can have at least 50, at least 100, at least 200, at least 500, at least 1000, at least 5000 or at least 10,000 or more subjects.

[0130] Upon identification of a collection of subjects, information about each subject is recorded and associated with each subject as a database. The information associated with each of the subjects, includes, but is not limited to, information related to historical characteristics of the subjects, phenotypic characteristics and also genotypic characteristics, medical characteristics and any other traits and characteristics about the subject that can be determined. This information will serve as the basis for sorting the database.

[0131] In an exemplary embodiment, the subjects are mammals, such as humans, and the information relates to one or more of parameters, such as age, sex, medical history, ethnicity and any other factor. Such information, when the animals are humans, for example, can be obtained by a questionnaire and by observations about the individual, such as hair color, eye color and other characteristics. Genotypic information can be obtained from tissue or other body and body fluid samples from the subject.

[0132] The healthy genomic database can include profiles and polymorphisms from healthy individuals from a library of blood samples where each sample in the library is an individual and separate blood or other tissue sample. Each sample in the database is profiled as to the sex, age, ethnic group, and disease history of the donor.

[0133] The databases are generated by first identifying healthy populations of subjects and obtaining information about each subject that will serve as the sorting parameters for the database. This information can be entered into a storage medium, such as the memory of a computer.

[0134] The information obtained about each subject in a population used for generating the database is stored in a computer memory or other suitable storage medium. The information is linked to an identifier associated with each subject. Hence the database will identify a subject, for example by a datapoint representative of a bar code, and then all information, such as the information from a ques-

tionnaire, regarding the individual is associated with the datapoint. As the information is collected the database is generated.

[0135] Thus, for example, profile information, such as subject histories obtained from questionnaires, is collected in the database. The resulting database can be sorted as desired, using standard software, such as by age, sex and/or ethnicity. An exemplary questionnaire for subjects from whom samples are to be obtained is shown in FIGS. 22A-D. Each questionnaire, for example, can be identified by a bar code, particularly a machine readable bar code for entry into the database. After a subject provides data and is deemed to be healthy (i.e., meets standards for blood donation), the data in the questionnaire is entered into the database and is associated with the bar code. A tissue, cell or blood sample is obtained from the subject.

[0136] FIG. 4 exemplifies processing and tracking of blood sample components. Each component is tracked with a bar code, dated, is entered into the database and associated with the subject and the profile of the subject. Typically, the whole blood is centrifuged to produce plasma, red blood cells (which pellet) and leukocytes found in the buffy coat which layers in between. Various samples are obtained and coded with a bar code and stored for use as needed.

[0137] Samples are collected from the subjects. The samples include, but are not limited to, tissues, cells, and fluids, such as nucleic acid, blood, plasma, amniotic fluid, synovial fluid, urine, saliva, aqueous humor, sweat, sperm samples and cerebral spinal fluid. It is understood that the particular set of samples depends upon the organisms in the population.

[0138] Once samples are obtained the collection can be stored and, in some embodiments, each sample is indexed with an identifier, particularly a machine readable code, such as a bar code. For analyses, the samples or components of the samples, particularly biopolymers and small molecules, such as nucleic acids and/or proteins and metabolites, are isolated.

[0139] After samples are analyzed, this information is entered into the database in the memory of the storage medium and associated with each subject. This information includes, but is not limited to, genotypic information. Particularly, nucleic acid sequence information and other information indicative of polymorphisms, such as masses of PCR fragments, peptide fragment sequences or masses, spectra of biopolymers and small molecules and other indicia of the structure or function of a gene, gene product or other marker from which the existence of a polymorphism within the population can be inferred.

[0140] In an exemplary embodiment, a database can be derived from a collection of blood samples. For example, FIG. 1 (see, also FIG. 10) shows the status of a collection of over 5000 individual samples. The samples were processed in the laboratory following SOP (standard operating procedure) guidelines. Any standard blood processing protocol can be used.

[0141] For the exemplary database described herein, the following criteria were used to select subjects:

[0142] No testing is done for infectious agents.

[0143] Age: At least 17 years old

[0144] Weight: Minimum of 110 pounds

[0145] Permanently Disqualified:

- [0146]** History of hepatitis (after age 11)
- [0147]** Leukemia Lymphoma
- [0148]** Human immunodeficiency virus (HIV), AIDS
- [0149]** Chronic kidney disease

[0150] Temporarily Disqualified:

- [0151]** Pregnancy—until six weeks after delivery, miscarriage or abortion
- [0152]** Major surgery or transfusions—for one year
- [0153]** Mononucleosis—until complete recovery
- [0154]** Prior whole blood donation—for eight weeks
- [0155]** Antibiotics by injection for one week; by mouth, for forty-eight hours, except antibiotics for skin complexion;

[0156] 5 year Deferment:

- [0157]** Internal cancer and skin cancer if it has been removed, is healed and there is no recurrence

[0158] These correspond to blood bank criteria for donating blood and represent a healthy population as defined herein for a human healthy database.

[0159] 5 Structure of the Database

[0160] Any suitable database structure and format known to those of skill in the art can be employed. For example, a relational database is an exemplary format in which data are stored as matrices or tables of the parameters linked by an indexer that identifies each subject. Software for preparing and manipulating, including sorting the database, can be readily developed or adapted from commercially available software, such as Microsoft Access.

[0161] Quality Control

[0162] Quality control procedures can be implemented. For example, after collection of samples, the quality of the collection in the bank can be assessed. For example, mix-up of samples can be checked by testing for known markers, such as sex. After samples are separated by ethnicity, samples are randomly tested for a marker associated with a particular ethnicity, such as HLA DQA1 group specific component, to assess whether the samples have been properly sorted by ethnic group. An exemplary sample bank is depicted in FIG. 4.

[0163] Obtaining Genotypic Data and Other Parameters for the Database

[0164] After informational and historical parameters are entered into the database, material from samples obtained from each subject, is analyzed. Analyzed material include proteins, metabolites, nucleic acids, lipids and any other desired constituent of the material. For example, nucleic acids, such as genomic DNA, can be analyzed by sequencing.

[0165] Sequencing can be performed using any method known to those of skill in the art. For example, if a polymorphism is identified or known, and it is desired to assess its frequency or presence among the subjects in the

database, the region of interest from each sample can be isolated, such as by PCR or restriction fragments, hybridization or other suitable method known to those of skill in the art and sequenced. For purposes herein, sequencing analysis can be effected using mass spectrometry (see, e.g., U.S. Pat. Nos. 5,547,835, 5,622,824, 5,851,765, and 5,928,906). Nucleic acids also can be sequenced by hybridization (see, e.g., U.S. Pat. Nos. 5,503,980, 5,631,134, 5,795,714) and including analysis by mass spectrometry (see, U.S. application Ser. Nos. 08/419,994 and 09/395,409).

[0166] In other detection methods, it is necessary to first amplify prior to identifying the allelic variant. Amplification can be performed, e.g., by PCR and/or LCR, according to methods known in the art. In one embodiment, genomic DNA of a cell is exposed to two PCR primers and amplification for a number of cycles sufficient to produce the required amount of amplified DNA. In some embodiments, the primers are located between 150 and 350 base pairs apart.

[0167] Alternative amplification methods include: self sustained sequence replication (Guatelli, J. C. et al., 1990, Proc. Natl. Acad. Sci. U.S.A. 87:1874-1878), transcriptional amplification system (Kwoh, D. Y. et al., 1989, Proc. Natl. Acad. Sci. U.S.A. 86:1173-1177), Q-Beta Replicase (Lizardi, P. M. et al., 1988, Bio/Technology 6:1197), or any other nucleic acid amplification method, followed by the detection of the amplified molecules using techniques well known to those of skill in the art. These detection schemes are especially useful for the detection of nucleic acid molecules if such molecules are present in very low numbers.

[0168] Nucleic acids also can be analyzed by detection methods and protocols, particularly those that rely on mass spectrometry (see, e.g., U.S. Pat. No. 5,605,798, 6,043,031, allowed copending U.S. application Ser. No. 08/744,481, U.S. application Ser. No. 08/990,851 and International PCT application No. WO 99/31278, International PCT application No. WO 98/20019). These methods can be automated (see, e.g., copending U.S. application Ser. No. 09/285,481 and published International PCT application No. PCT/US00/08111, which describes an automated process line). Among the methods of analysis herein are those involving the primer oligo base extension (PROBE) reaction with mass spectrometry for detection (described herein and elsewhere, see e.g., U.S. Pat. No. 6,043,031; see, also U.S. application Ser. Nos. 09/287,681, 09/287,682, 09/287,141 and 09/287,679, allowed copending U.S. application Ser. No. 08/744,481, International PCT application No. PCT/US97/20444, published as International PCT application No. WO 98/20019, and based upon U.S. application Ser. Nos. 08/744,481, 08/744,590, 08/746,036, 08/746,055, 08/786,988, 08/787,639, 08/933,792, 08/746,055, 08/786,988 and 08/787,639; see, also U.S. application Ser. No. 09/074,936, U.S. Pat. No. 6,024,925, and U.S. application Ser. Nos. 08/746,055 and 08/786,988, and published International PCT application No. WO 98/20020)

[0169] A chip based format in which the biopolymer is linked to a solid support, such as a silicon or silicon-coated substrate, such as in the form of an array, is among the formats for performing the analyses is. Generally, when analyses are performed using mass spectrometry, particularly MALDI, small nanoliter volumes of sample are loaded on, such that the resulting spot is about, or smaller than, the

size of the laser spot. It has been found that when this is achieved, the results from the mass spectrometric analysis are quantitative. The area under the signals in the resulting mass spectra are proportional to concentration (when normalized and corrected for background). Methods for preparing and using such chips are described in U.S. Pat. No. 6,024,925, co-pending U.S. application Ser. Nos. 08/786,988, 09/364,774, 09/371,150 and 09/297,575; see, also U.S. application Ser. No. PCT/US97/20195, which published as WO 98/20020. Chips and kits for performing these analyses are commercially available from SEQUENOM under the trademark MassARRAY. MassArray relies on the fidelity of the enzymatic primer extension reactions combined with the miniaturized array and MALDI-TOF (Matrix-Assisted Laser Desorption Ionization-Time of Flight) mass spectrometry to deliver results rapidly. It accurately distinguishes single base changes in the size of DNA fragments associated with genetic variants without tags.

[0170] The methods provided herein permit quantitative determination of alleles. The areas under the signals in the mass spectra can be used for quantitative determinations. The frequency is determined from the ratio of the signal to the total area of all of the spectrum and corrected for background. This is possible because of the PROBE technology as described in the above applications incorporated by reference herein.

[0171] Additional methods of analyzing nucleic acids include amplification-based methods including polymerase chain reaction (PCR), ligase chain reaction (LCR), mini-PCR, rolling circle amplification, autocatalytic methods, such as those using Q β replicase, TAS, 3SR, and any other suitable method known to those of skill in the art.

[0172] Other methods for analysis and identification and detection of polymorphisms, include but are not limited to, allele specific probes, Southern analyses, and other such analyses.

[0173] The methods described below provide ways to fragment given amplified or non-amplified nucleotide sequences thereby producing a set of mass signals when mass spectrometry is used to analyze the fragment mixtures.

[0174] Amplified fragments are yielded by standard polymerase chain methods (U.S. Pat. Nos. 4,683,195 and 4,683,202). The fragmentation method involves the use of enzymes that cleave single or double strands of DNA and enzymes that ligate DNA. The cleavage enzymes can be glycosylases, nickases, and site-specific and non site-specific nucleases, such as, but are not limited to, glycosylases, nickases and site-specific nucleases.

[0175] Glycosylase Fragmentation Method

[0176] DNA glycosylases specifically remove a certain type of nucleobase from a given DNA fragment. These enzymes can thereby produce abasic sites, which can be recognized either by another cleavage enzyme, cleaving the exposed phosphate backbone specifically at the abasic site and producing a set of nucleobase specific fragments indicative of the sequence, or by chemical means, such as alkaline solutions and or heat. The use of one combination of a DNA glycosylase and its targeted nucleotide would be sufficient to generate a base specific signature pattern of any given target region.

[0177] Numerous DNA glycosylases are known. For example, a DNA glycosylase can be uracil-DNA glycosylase (UDG), 3-methyladenine DNA glycosylase, 3-methyladenine DNA glycosylase II, pyrimidine hydrate-DNA glycosylase, FaPy-DNA glycosylase, thymine mismatch-DNA glycosylase, hypoxanthine-DNA glycosylase, 5-Hydroxymethyluracil DNA glycosylase (HmUDG), 5-Hydroxymethylcytosine DNA glycosylase, or 1,N6-etheno-adenine DNA glycosylase (see, e.g., U.S. Pat. Nos. 5,536,649, 5,888,795, 5,952,176 and 6,099,553, International PCT application Nos. WO 97/03210, WO 99/54501; see, also, Eftedal et al. (1993) *Nucleic Acids Res* 21:2095-2101, Bjelland and Seeberg (1987) *Nucleic Acids Res.* 15:2787-2801, Saparbaev et al. (1995) *Nucleic Acids Res.* 23:3750-3755, Bessho (1999) *Nucleic Acids Res.* 27:979-983) corresponding to the enzyme's modified nucleotide or nucleotide analog target. uracil-DNA glycosylase (UDG) is an exemplary glycosylase.

[0178] Uracil, for example, can be incorporated into an amplified DNA molecule by amplifying the DNA in the presence of normal DNA precursor nucleotides (e.g. dCTP, dATP, and dGTP) and dUTP. When the amplified product is treated with UDG, uracil residues are cleaved. Subsequent chemical treatment of the products from the UDG reaction results in the cleavage of the phosphate backbone and the generation of nucleobase specific fragments. Moreover, the separation of the complementary strands of the amplified product prior to glycosylase treatment allows complementary patterns of fragmentation to be generated. Thus, the use of dUTP and Uracil DNA glycosylase allows the generation of T specific fragments for the complementary strands, thus providing information on the T as well as the A positions within a given sequence. Similar to this, a C-specific reaction on both (complementary) strands (i.e. with a C-specific glycosylase) yields information on C as well as G positions within a given sequence if the fragmentation patterns of both amplification strands are analyzed separately. Thus, with the glycosylase method and mass spectrometry, a full series of A, C, G and T specific fragmentation patterns can be analyzed.

[0179] Nickase Fragmentation Method

[0180] A DNA nickase, or DNase, can be used to recognize and cleave one strand of a DNA duplex. Numerous nickases are known. Among these, for example, are nickase NY2A nickase and NYS1 nickase (Megabase) with the following cleavage sites:

[0181] NY2A: 5' . . . R AG . . . 3'

[0182] 3' . . . Y TC . . . 5' where R=A or G and Y=C or T

[0183] NYS1: 5' . . . CC[A/G/T] . . . 3'

[0184] 3' . . . GG[T/C/A] . . . 5'.

[0185] Fen-Ligase Fragmentation Method

[0186] The Fen-ligase method involves two enzymes: Fen-1 enzyme and a ligase. The Fen-1 enzyme is a site-specific nuclease known as a "flap" endonuclease (U.S. Pat. Nos. 5,843,669, 5,874,283, and 6,090,606). This enzyme recognizes and cleaves DNA "flaps" created by the overlap of two oligonucleotides hybridized to a target DNA strand. This cleavage is highly specific and can recognize single base pair mutations, permitting detection of a single homo-

logue from an individual heterozygous at one SNP of interest and then genotyping that homologue at other SNPs occurring within the fragment. Fen-1 enzymes can be Fen-1 like nucleases e.g. human, murine, and *Xenopus* XPG enzymes and yeast RAD2 nucleases or Fen-1 endonucleases from, for example, *M. jannaschii*, *P. furiosus*, and *P. woesei*. Among such enzymes are the Fen-1 enzymes.

[0187] The ligase enzyme forms a phosphodiester bond between two double stranded nucleic acid fragments. The ligase can be DNA Ligase I or DNA Ligase III (see, e.g., U.S. Pat. Nos. 5,506,137, 5,700,672, 5,858,705 and 5,976,806; see, also, Waga, et al. (1994) J. Biol. Chem. 269:10923-10934, Li et al. (1994) Nucleic Acids Res. 22:632-638, Arrand et al. (1986) J. Biol. Chem. 261:9079-9082, Lehman (1974) Science 186:790-797, Higgins and Cozzarelli (1979) Methods Enzymol. 68:50-71, Lasko et al. (1990) Mutation Res. 236:277-287, and Lindahl and Barnes (1992) Ann. Rev. Biochem. 61:251-281). Thermostable ligase (Epicenter Technologies), where "thermostable" denotes that the ligase retains activity even after exposure to temperatures necessary to separate two strands of DNA, are among the ligases for use herein.

[0188] Type IIS Enzyme Fragmentation Method

[0189] Restriction enzymes bind specifically to and cleave double-stranded DNA at specific sites within or adjacent to a particular recognition sequence. These enzymes have been classified into three groups (e.g. Types I, II, and III) as known to those of skill in the art. Because of the properties of type I and type III enzymes, they have not been widely used in molecular biological applications. Thus, for purposes herein type II enzymes are among those contemplated. Of the thousands of restriction enzymes known in the art, there are 179 different type II specificities. Of the 179 unique type II restriction endonucleases, 31 have a 4-base recognition sequence, 11 have a 5-base recognition sequence, 127 have a 6-base recognition sequence, and 10 have recognition sequences of greater than six bases (U.S. Pat. No. 5,604,098). Of category type II enzymes, type IIS is exemplified herein.

[0190] Type IIS enzymes can be Alw XI, Bbv I, Bce 83, Bpm I, Bsg I, Bsm AI, Bsm FI, Bsa I, Bcc I, Bcg I, Ear I, Eco 57I, Esp 3I, Fau I, Fok I, Gsu I, Hga I, Mme I, Mbo II, Sap I, and the others.

[0191] The Fok I enzyme endonuclease is an exemplary well characterized member of the Type IIS class (see, e.g., U.S. Pat. Nos. 5,714,330, 5,604,098, 5,436,150, 6,054,276 and 5,871,911; see, also, Szybalski et al. (1991) Gene 100:13-26, Wilson and Murray (1991) Ann. Rev. Genet. 25:585-627, Sugisaki et al. (1981) Gene 16:73-78, Podhajski and Szalski (1985) Gene 40:175-182. Fok I recognizes the sequence 5'GGATG-3' and cleaves DNA accordingly. Type IIS restriction sites can be introduced into DNA targets by incorporating the sites into primers used to amplify such targets. Fragments produced by digestion with Fok I are site specific and can be analyzed by mass spectrometry methods such as MALDI-TOF mass spectrometry, ESI-TOF mass spectrometry, and any other type of mass spectrometry well known to those of skill in the art.

[0192] Once a polymorphism has been found to correlate with a parameter such as age, age groups can be screened for polymorphisms. The possibility of false results due to allelic

dropout is examined by doing comparative PCR in an adjacent region of the genome.

[0193] Analyses

[0194] In using the database, allelic frequencies can be determined across the population by analyzing each sample in the population individually, determining the presence or absence of allele or marker of interest in each individual sample, and then determining the frequency of the marker in the population. The database can then be sorted (stratified) to identify any correlations between the allele and a selected parameter using standard statistical analysis. If a correlation is observed, such as a decrease in a particular marker with age or correlation with sex or other parameter, then the marker is a candidate for further study, such as genetic mapping to identify a gene or pathway in which it is involved. The marker can then be correlated, for example, with a disease. Haplotyping also can be carried out. Genetic mapping can be effected using standard methods and can also require use of databases of others, such as databases previously determined to be associated with a disorder.

[0195] Exemplary analyses have been performed and these are shown in the figures, and discussed herein.

[0196] Sample Pooling

[0197] It has been found that using the databases provided herein, or any other database of such information, substantially the same frequencies that were obtained by examining each sample separately can be obtained by pooling samples, such as in batches of 10, 20, 50, 100, 200, 500, 1000 or any other number. A precise number can be determined empirically if necessary, and can be as low as 3.

[0198] In one embodiment, the frequency of genotypic and other markers can be obtained by pooling samples. To do this a target population and a genetic variation to be assessed is selected, a plurality of samples of biopolymers are obtained from members of the population, and the biopolymer from which the marker or genotype can be inferred is determined or detected. A comparison of samples tested in pools and individually and the sorted results therefrom are shown in FIG. 9, which shows frequency of the factor VII Allele 353Q. FIG. 10 depicts the frequency of the CETP Allele in pooled versus individual samples. FIG. 15 shows ethnic diversity among various ethnic groups in the database using pooled DNA samples to obtain the data. FIGS. 12-14 show mass spectra for these samples.

[0199] Pooling of test samples has application not only to the healthy databases provided herein, but also to use in gathering data for entry into any database of subjects and genotypic information, including typical databases derived from diseased populations. What is demonstrated herein, is the finding that the results achieved are statistically the same as the results that would be achieved if each sample is analyzed separately. Analysis of pooled samples by a method, such as the mass spectrometric methods provided herein, permits resolution of such data and quantitation of the results.

[0200] For factor VII the R53Q acid polymorphism was assessed. In FIG. 9, the "individual" data represent allelic frequency observed in 92 individuals reactions. The pooled data represent the allelic frequency of the same 92 individuals pooled into a single probe reaction. The concentration of

DNA in the samples of individual donors is 250 nanograms. The total concentration of DNA in the pooled samples is also 250 nanograms, where the concentration of any individual DNA is 2.7 nanograms.

[0201] It also was shown that it is possible to reduce the DNA concentration of individuals in a pooled samples from 2.7 nanograms to 0.27 nanograms without any change in the quality of the spectrum or the ability to quantitate the amount of sample detected. Hence low concentrations of sample can be used in the pooling methods.

[0202] Use of the Databases and Markers Identified Thereby

[0203] The successful use of genomics requires a scientific hypothesis (i.e., common genetic variation, such as a SNP), a study design (i.e., complex disorders), samples and technology, such as the chip-based mass spectrometric analyses (see, e.g., U.S. Pat. No. 5,605,798, U.S. Pat. No. 5,777,324, U.S. Pat. No. 6,043,031, allowed copending U.S. application Ser. No. 08/744,481, U.S. application Ser. No. 08/990,851, International PCT application No. WO 98/20019, copending U.S. application Ser. No. 09/285,481, which describes an automated process line for analyses; see, also, U.S. application Ser. Nos. 08/617,256, 09/287,681, 09/287,682, 09/287,141 and 09/287,679, allowed copending U.S. application Ser. No. 08/744,481, International PCT application No. PCT/US97/20444, published as International PCT application No. WO 98/20019, and based upon U.S. application Ser. Nos. 08/744,481, 08/744,590, 08/746,036, 08/746,055, 08/786,988, 08/787,639, 08/933,792, 08/746,055, 09/266,409, 08/786,988 and 08/787,639; see, also U.S. application Ser. No. 09/074,936). All of these aspects can be used in conjunction with the databases provided herein and samples in the collection.

[0204] The databases and markers identified thereby can be used, for example, for identification of previously unidentified or unknown genetic markers and to identify new uses for known markers. As markers are identified, these can be entered into the database to use as sorting parameters from which additional correlations can be determined.

[0205] Previously Unidentified or Unknown Genetic Markers

[0206] The samples in the healthy databases can be used to identify new polymorphisms and genetic markers, using any mapping, sequencing, amplification and other methodologies, and in looking for polymorphisms among the population in the database. The thus-identified polymorphism can then be entered into the database for each sample, and the database sorted (stratified) using that polymorphism as a sorting parameter to identify any patterns and correlations that emerge, such as age correlated changes in the frequency of the identified marker. If a correlation is identified, the locus of the marker can be mapped and its function or effect assessed or deduced.

[0207] Thus, the databases here provide means for:

[0208] identification of significantly different allelic frequencies of genetic factors by comparing the occurrence or disappearance of the markers with increasing age in population and then associating the markers with a disease or a biochemical pathway;

[0209] identification of significantly different allelic frequencies of disease causing genetic factors by comparing the male with the female population or comparing other selected stratified populations and associating the markers with a disease or a biochemical pathway;

[0210] identification of significantly different allelic frequencies of disease causing genetic factors by comparing different ethnic groups and associating the markers with a disease or a biochemical pathway that is known to occur in high frequency in the ethnic group;

[0211] profiling potentially functional variants of genes through the general panmixed population stratified according to age, sex, and ethnic origin and thereby demonstrating the contribution of the variant genes to the physical condition of the investigated population;

[0212] identification of functionally relevant gene variants by gene disequilibrium analysis performed within the general panmixed population stratified according to age, sex, and ethnic origin and thereby demonstrating their contribution to the physical condition of investigated population;

[0213] identification of potentially functional variants of chromosomes or parts of chromosomes by linkage disequilibrium analysis performed within the general panmixed population stratified according to age, sex, and ethnic origin and thereby demonstrating their contribution to the physical condition of investigated population.

[0214] Uses of the Identified Markers and Known Markers

[0215] The databases can also be used in conjunction with known markers and sorted to identify any correlations. For example, the databases can be used for:

[0216] determination and evaluation of the penetrance of medically relevant polymorphic markers;

[0217] determination and evaluation of the diagnostic specificity of medically relevant genetic factors;

[0218] determination and evaluation of the positive predictive value of medically relevant genetic factors;

[0219] determination and evaluation of the onset of complex diseases, such as, but are not limited to, diabetes, hypertension, autoimmune diseases, arteriosclerosis, cancer and other diseases within the general population with respect to their causative genetic factors;

[0220] delineation of the appropriate strategies for preventive disease treatment;

[0221] delineation of appropriate timelines for primary disease intervention;

[0222] validation of medically relevant genetic factors identified in isolated populations regarding their general applicability;

[0223] validation of disease pathways including all potential target structures identified in isolated populations regarding their general applicability; and

[0224] validation of appropriate drug targets identified in isolated populations regarding their general applicability.

[0225] Among the diseases and disorders for which polymorphisms can be linked include, those linked to inborn errors of metabolism, acquired metabolic disorders, intermediary metabolism, oncogenesis pathways, blood clotting pathways, and DNA synthetic and repair pathways, DNA repair/replication/transcription factors and activities, e.g., such as genes related to oncogenesis, aging and genes involved in blood clotting and the related biochemical pathways that are related to thrombosis, embolism, stroke, myocardial infarction, angiogenesis and oncogenesis.

[0226] For example, a number of diseases are caused by or involve deficient or defective enzymes in intermediary metabolism (see, e.g., Tables 1 and 2, below) that result, upon ingestion of the enzyme substrates, in accumulation of harmful metabolites that damage organs and tissues, particularly an infant's developing brain and other organs, resulting in mental retardation and other developmental disorders.

[0227] Identification of Markers and Genes for Such Disorders is of Great Interest.

[0228] Model Systems

[0229] Several gene systems, p21, p53 and Lipoprotein Lipase polymorphism (N291S), were selected. The p53 gene is a tumor suppressor gene that is mutated in diverse tumor types. One common allelic variant occurs at codon 72. A polymorphism that has been identified in the p53 gene, i.e., the R72P allele, results in an amino acid exchange, arginine to proline, at codon 72 of the gene.

[0230] Using diseased populations, it has been shown that there are ethnic differences in the allelic distribution of these alleles among African-Americans and Caucasians in the U.S. The results here support this finding and also demonstrate that the results obtained with a healthy database are meaningful (see, FIG. 7B).

[0231] The 291S allele leads to reduced levels of high density lipoprotein cholesterol (HDL-C) that is associated with an increased risk of males for arteriosclerosis and in particular myocardial infarction (see, Reymer et al. (1995) *Nature Genetics* 10:28-34).

[0232] Both genetic polymorphisms were profiled within a part of the Caucasian population-based sample bank. For the polymorphism located in the lipoprotein lipase gene a total of 1025 unselected individuals (436 males and 589 females) were tested. Genomic DNA was isolated from blood samples obtained from the individuals.

[0233] As shown in the Examples and figures, an exemplary database containing about 5000 subjects, answers to the questionnaire (see FIG. 3), and genotypic information has been stratified. A particular known allele has been selected, and the samples tested for the marker using mass spectrometric analyses, particularly PROBE (see the EXAMPLES) to identify polymorphisms in each sample. The population in the database has been sorted according to various parameters and correlations have been observed. For example, FIGS. 2A-C, show sorting of the data by age and sex for the Lipoprotein Lipase gene in the Caucasian population in the database. The results show a decrease in the

frequency of the allele with age in males but no such decrease in females. Other alleles that have been tested against the database, include, alleles of p53, p21 and factor VII. Results when sorted by age are shown in the figures.

[0234] These examples demonstrate an effect of altered frequency of disease causing genetic factors within the general population. The scientific interpretation of those results allows prediction of medical relevance of polymorphic genetic alterations. In addition, conclusions can be drawn with regard to their penetrance, diagnostic specificity, positive predictive value, onset of disease, most appropriate onset of preventive strategies, and the general applicability of genetic alterations identified in isolated populations to panmictic populations.

[0235] Therefore, an age- and sex-stratified population-based sample bank that is ethnically homogenous is a suitable tool for rapid identification and validation of genetic factors regarding their potential medical utility.

[0236] Exemplary Computer System for Creating, Storing and Processing the Databases

[0237] Systems

[0238] Systems, including computers, containing the databases are provided herein. The computers and databases can be used in conjunction, for example, with the APL system (see, copending U.S. application Ser. No. 09/285,481), which is an automated system for analyzing biopolymers, particularly nucleic acids. Results from the APL system can be entered into the database.

[0239] Any suitable computer system can be used. The computer system can be integrated into systems for sample analysis, such as the automated process line described herein (see, e.g., copending U.S. application Ser. No. 09/285,481).

[0240] FIG. 17 is a block diagram of a computer constructed to provide and process the databases described herein. The processing that maintains the database and performs the methods and procedures can be performed on multiple computers all having a similar construction, or can be performed by a single, integrated computer. For example, the computer through which data are added to the database can be separate from the computer through which the database is sorted, or can be integrated with it. In either arrangement, the computers performing the processing can have a construction as illustrated in FIG. 17.

[0241] FIG. 17 is a block diagram of an exemplary computer 1700 that maintains the database described above and performs the methods and procedures. Each computer 1700 operates under control of a central processor unit (CPU) 1702, such as a "Pentium" microprocessor and associated integrated circuit chips, available from Intel Corporation of Santa Clara, Calif., USA. A computer user can input commands and data from a keyboard and display mouse 1704 and can view inputs and computer output at a display 1706. The display is typically a video monitor or flat panel display device. The computer 1700 also includes a direct access storage device (DASD) 1707, such as a fixed hard disk drive. The memory 1708 typically comprises volatile semiconductor random access memory (RAM). Each computer can include a program product reader 1710 that accepts a program product storage device 1712, from which the program product reader can read data (and to

which it can optionally write data). The program product reader can comprise, for example, a disk drive, and the program product storage device can comprise removable storage media such as a magnetic floppy disk, an optical CD-ROM disc, a CD-R disc, a CD-RW disc, or a DVD data disc. If desired, the computers can be connected so they can communicate with each other, and with other connected computers, over a network 1713. Each computer 1700 can communicate with the other connected computers over the network 1713 through a network interface 1714 that enables communication over a connection 1716 between the network and the computer.

[0242] The computer 1700 operates under control of programming steps that are temporarily stored in the memory 1708 in accordance with conventional computer construction. When the programming steps are executed by the CPU 1702, the pertinent system components perform their respective functions. Thus, the programming steps implement the functionality of the system as described above. The programming steps can be received from the DASD 1707, through the program product reader 1712, or through the network connection 1716. The storage drive 1710 can receive a program product, read programming steps recorded thereon and transfer the programming steps into the memory 1708 for execution by the CPU 1702. As noted above, the program product storage device 1710 can comprise any one of multiple removable media having recorded computer-readable instructions, including magnetic floppy disks and CD-ROM storage discs. Other suitable program product storage devices can include magnetic tape and semiconductor memory chips. In this way, the processing steps necessary for operation can be embodied on a program product.

[0243] Alternatively, the program steps can be received into the operating memory 1708 over the network 1713. In the network method, the computer receives data including program steps into the memory 1708 through the network interface 1714 after network communication has been established over the network connection 1716 by well-known methods that will be understood by those skilled in the art without further explanation. The program steps are then executed by the CPU 1702 to implement the processing of the Garment Database system.

[0244] It should be understood that all of the computers of the system and can have a construction similar to that shown in FIG. 17. Details described with respect to the FIG. 17 computer 1700 will be understood to apply to all computers of the system 1700. This is indicated by multiple computers 1700 shown connected to the network 1713. Any one of the computers 1700 can have an alternative construction, so long as they can communicate with the other computers and support the functionality described herein.

[0245] FIG. 18 is a flow diagram that illustrates the processing steps performed using the computer illustrated in FIG. 17, to maintain and provide access to the databases, such as for identifying polymorphic genetic markers. In particular, the information contained in the database is stored in computers having a construction similar to that illustrated in FIG. 17. The first step for maintaining the database, as indicated in FIG. 18, is to identify healthy members of a population. As noted above, the population members are subjects that are selected only on the basis of being healthy, and where the subjects are mammals, such as humans, they can be selected based upon apparent health

and the absence of detectable infections. The step of identifying is represented by the flow diagram box numbered 1802.

[0246] The next step, represented by the flow diagram box numbered 1804, is to obtain identifying and historical information and data relating to the identified members of the population. The information and data comprise parameters for each of the population members, such as member age, ethnicity, sex, medical history, and ultimately genotypic information. Initially, the parameter information is obtained from a questionnaire answered by each member, from whom a body tissue or body fluid sample also is obtained. The step of entering and storing these parameters into the database of the computer is represented by the flow diagram box numbered 1806. As additional information about each population member and corresponding sample is obtained, this information can be inputted into the database and can serve as a sorting parameter.

[0247] In the next step, represented by the flow diagram box numbered 1808, the parameters of the members are associated with an indexer. This step can be executed as part of the database storage operation, such as when a new data record is stored according to the relational database structure and is automatically linked with other records according to that structure. The step 1806 also can be executed as part of a conventional data sorting or retrieval process, in which the database entries are searched according to an input search or indexing key value to determine attributes of the data. For example, such search and sort techniques can be used to follow the occurrence of known genetic markers and then determine if there is a correlation with diseases for which they have been implicated. Examples of this use are for assessing the frequencies of the p53 and Lipoprotein Lipase polymorphisms.

[0248] Such searching of the database also can be valuable for identifying one or more genetic markers whose frequency changes within the population as a function of age, ethnic group, sex, or some other criteria. This can allow the identification of previously unknown polymorphisms and, ultimately, identification of a gene or pathway involved in the onset and progression of disease.

[0249] In addition, the database can be used for taking an identified polymorphism and ascertaining whether it changes in frequency when the data are sorted according to a selected parameter.

[0250] In this way, the databases and methods provided herein permit, among other things, identification of components, particularly key components, of a disease process by understanding its genetic underpinnings, and also an understanding of processes, such as individual drug responses. The databases and methods provided herein also can be used in methods involving elucidation of pathological pathways, in developing new diagnostic assays, identifying new potential drug targets, and in identifying new drug candidates.

[0251] Morbidity and/or Early Mortality Associated Polymorphisms

[0252] A database containing information provided by a population of healthy blood donors who were not selected for any particular disease to can be used to identify polymorphisms and the alleles in which they are present, whose frequency decreases with age. These can represent morbidity susceptibility markers and genes.

[0253] Polymorphisms of the genome can lead to altered gene function, protein function or genome instability. To

identify those polymorphisms which have a clinical relevance/utility is the goal of a world-wide scientific effort. It can be expected that the discovery of such polymorphisms will have a fundamental impact on the identification and development of novel drug compounds to cure diseases. The strategy to identify valuable polymorphisms is cumbersome and dependent upon the availability of many large patient and control cohorts to show disease association. In particular, genes that cause a general risk of the population to suffer from any disease (morbidly susceptibility genes) will escape these case/control studies entirely.

[0254] Here described is a screening strategy to identify morbidly susceptibility genes underlying a variety of different diseases. The definition of a morbidly susceptibility gene is a gene that is expressed in many different cell types or tissues (housekeeping gene) and its altered function can facilitate the expression of a clinical phenotype caused by disease-specific susceptibility genes that are involved in a pathway specific for this disorder. In other words, these morbidly susceptibility genes predispose people to develop a distinct disease according to their genetic make-up for this disease.

[0255] Candidates for morbidly susceptibility genes can be found at the bottom level of pathways involving transcription, translation, heat-shock proteins, protein trafficking, DNA repair, assembly systems for subcellular structures (e.g. mitochondria, peroxysomes and other cellular microbodies), receptor signaling cascades, immunology, etc. Those pathways control the quality of life at the cellular level as well as for the entire organism. Mutations/polymorphisms located in genes encoding proteins for those pathways can reduce the fitness of cells and make the organism more susceptible to express the clinical phenotype caused by the action of a disease-specific susceptibility gene. Therefore, these morbidly susceptibility genes can be potentially involved in a whole variety of different complex diseases if not in all. Disease-specific susceptibility genes are involved in pathways that can be considered as disease-specific pathways like glucose-, lipid, hormone metabolism, etc.

[0256] The exemplified method permit, among other things, identification of genes and/or gene products involved in a man's general susceptibility to morbidly and/or mortality; use of these genes and/or gene products in studies to elucidate the genetic underpinnings of human diseases; use of these genes and/or gene products in combinatorial statistical analyses without or together with disease-specific susceptibility genes; use of these genes and/or gene products to predict penetrance of disease susceptibility genes; use of these genes and/or gene products in predisposition and/or acute medical diagnostics and use of these genes and/or gene products to develop drugs to cure diseases and/or to extend the life span of humans.

[0257] Screening Process

[0258] The healthy population stratified by age, gender and ethnicity, etc. is a very efficient and a universal screening tool for morbidly associated genes. Changes of allelic frequencies in the young compared to the old population are expected to indicate putative morbidly susceptibility genes. Individual samples of this healthy population base can be pooled to further increase the throughput. In an experiment, pools of young and old Caucasian females and males were applied to screen more than 400 randomly chosen single nucleotide polymorphisms located in many different genes. Candidate polymorphisms were identified if the allelic difference was greater than 8% between young and old for both

or only one of the genders. The initial results were assayed again in at least one independent subsequent experiments. Repeated experiments are necessary to recognize unstable biochemical reactions, which occur with a frequency of about 2-3% and can mimic age-related allelic frequency differences. Average frequency differences and standard deviations are calculated after successful reproducibility of initial results. The final allelic frequency is then compared to a reference population of Caucasian CEPH sample pool. The result should show similar allelic frequencies in the young Caucasian population. Subsequently, the exact allele frequencies of candidates including genotype information were obtained by analyzing all individual samples. This procedure is straight forward with regard to time and cost. It enables the screening of an enormous number of SNPs. So far, several markers with a highly significant association to age were identified and described below.

[0259] In general at least 5 individuals in a stratified population should be screened to produce statistically significant results. The frequency of the allele is determined for an age stratified population. Chi square analysis is then performed on the allelic frequencies to determine if the difference between age groups is statistically significant. A p value less than 0.1 is considered to represent a statistically significant difference. Typically the p value should be less than 0.05.

[0260] Clinical Trials

[0261] The identification of markers whose frequency in a population decreases with age also allows for better designed and balanced clinical trials. Currently, if a clinical trial utilizes a marker as a significant endpoint in a study and the marker disappears with age, then the results of the study can be inaccurate. By using methods provided herein, it can be ascertained that if a marker decreases in frequency with age. This information can be considered and controlled when designing the study. For, example, an age independent marker could be substituted in its place.

[0262] The following examples are included for illustrative purposes only and are not intended to limit the scope of the invention.

EXAMPLE 1

[0263] This example describes the use of a database containing information provided by a population of healthy blood donors who were not selected for any particular disease to determine the distribution of allelic frequencies of known genetic markers with age and by sex in a Caucasian subpopulation of the database. The results described in this example demonstrate that a disease-related genetic marker or polymorphism can be identified by sorting a healthy database by a parameter or parameters, such as age, sex and ethnicity.

[0264] Generating a Database

[0265] Blood was obtained by venous puncture from human subjects who met blood bank criteria for donating blood. The blood samples were preserved with EDTA at pH 8.0 and labeled. Each donor provided information such as age, sex, ethnicity, medical history and family medical history. Each sample was labeled with a barcode representing identifying information. A database was generated by entering, for each donor, the subject identifier and information corresponding to that subject into the memory of a computer storage medium using commercially available software, e.g., Microsoft Access.

[0266] Model Genetic Markers

[0267] The frequencies of polymorphisms known to be associated at some level with disease were determined in a subpopulation of the subjects represented in the database. These known polymorphisms occur in the p21, p53 and Lipoprotein Lipase genes. Specifically, the N291S polymorphism (N291S) of the Lipoprotein Lipase gene, which results in a substitution of a serine for an asparagine at amino acid codon 291, leads to reduced levels of high density lipoprotein cholesterol (HDL-C) that is associated with an increased risk of males for arteriosclerosis and in particular myocardial infarction (see, Reymer et al. (1995) *Nature Genetics* 10:28-34).

[0268] The p53 gene encodes a cell cycle control protein that assesses DNA damage and acts as a transcription factor regulating genes that control cell growth, DNA repair and apoptosis (programmed cell death). Mutations in the p53 gene have been found in a wide variety of different cancers, including different types of leukemia, with varying frequency. The loss of normal p53 function results in genomic instability an uncontrolled cell growth. A polymorphism that has been identified in the p53 gene, i.e., the R72P allele, results in the substitution of a proline for an arginine at amino acid codon 72 of the gene.

[0269] The p21 gene encodes a cyclin-dependent kinase inhibitor associated with G1phase arrest of normal cells. Expression of the p21 gene triggers apoptosis. Polymorphisms of the p21 gene have been associated with Wilms' tumor, a pediatric kidney cancer. One polymorphism of the p21 gene, the S31R polymorphism, results in a substitution of an arginine for a serine at amino acid codon 31.

[0270] Database Analysis

[0271] Sorting of Subjects According to Specific Parameters

[0272] The genetic polymorphisms were profiled within segments of the Caucasian subpopulation of the sample bank. For p53 profiling, the genomic DNA isolated from blood from a total of 1277 Caucasian subjects age 18-59 years and 457 Caucasian subjects age 60-79 years was analyzed. For p21 profiling, the genomic DNA isolated from blood from a total of 910 Caucasian subjects age 18-49 years and 824 Caucasian subjects age 50-79 years was analyzed. For lipoprotein lipase gene profiling, the genomic DNA from a total of 1464 Caucasian females and 1470 Caucasian males under 60 years of age and a total of 478 Caucasian females and 560 Caucasian males over 60 years of age was analyzed.

[0273] Isolation and Analysis of Genomic DNA

[0274] Genomic DNA was isolated from blood samples obtained from the individuals. Ten milliliters of whole blood from each individual was centrifuged at 2000xg. One milliliter of the buffy coat was added to 9 ml of 155 mM NH₄Cl, 10 mM KHCO₃, and 0.1 mM Na₂EDTA, incubated 10 min at room temperature and centrifuged for 10 min at 2000xg. The supernatant was removed, and the white cell pellet was washed in 155 mM NH₄Cl, 10 mM KHCO₃, and 0.1 mM Na₂EDTA and resuspended in 4.5 ml of 50 mM Tris, 5 mM EDTA and 1% SDS. Proteins were precipitated from the cell lysate by 6 M ammonium acetate, pH 7.3, and then separated from the nucleic acids by centrifugation at 3000xg. The nucleic acid was recovered from the supernatant by the addition of an equal volume of 100% isopropanol and centrifugation at 2000xg. The dried nucleic acid pellet was hydrated in 10 mM Tris, pH 7.6, and 1 mM Na₂EDTA and stored at 4° C.

[0275] Assays of the genomic DNA to determine the presence or absence of the known genetic markers were developed using the BiomassPROBE™ detection method (primer oligo base extension) reaction. This method uses a single detection primer followed by an oligonucleotide extension step to give products, which can be readily resolved by mass spectrometry, and, in particular, MALDI-TOF mass spectrometry. The products differ in length depending on the presence or absence of a polymorphism. In this method, a detection primer anneals adjacent to the site of a variable nucleotide or sequence of nucleotides, and the primer is extended using a DNA polymerase in the presence of one or more dideoxynTPs and, optionally, one or more deoxyNTPs. The resulting products are resolved by MALDI-TOF mass spectrometry. The mass of the products as measured by MALDI-TOF mass spectrometry makes possible the determination of the nucleotide(s) present at the variable site.

[0276] First, each of the Caucasian genomic DNA samples was subjected to nucleic acid amplification using primers corresponding to sites 5' and 3' of the polymorphic sites of the p21 (S31R allele), p53 (R72P allele) and Lipoprotein Lipase (N291S allele) genes. One primer in each primer pair was biotinylated to permit immobilization of the amplification product to a solid support. Specifically, the polymerase chain reaction primers used for amplification of the relevant segments of the p21, p53 and lipoprotein lipase genes are shown below: US4p21c31-2F (SEQ ID NO: 9) and US5p21-2R (SEQ ID NO: 10) for p21 gene amplification; US4-p53-ex4-F (also shown as p53-ex4US4 (SEQ ID NO: 2)) and US5-p53/2-4R (also shown as US5P53/4R (SEQ ID NO: 3)) for p53 gene amplification; and US4-LPL-F2 (SEQ ID NO: 16) and US5-LPL-R2 (SEQ ID NO: 17) for lipoprotein lipase gene amplification.

[0277] Amplification of the respective DNA sequences was conducted according to standard protocols. For example, primers can be used in a concentration of 8 pmol. The reaction mixture (e.g., total volume 50 µl) can contain Taq-polymerase including 10xbuffer and dNTPs. Cycling conditions for polymerase chain reaction amplification can typically be initially 5 min. at 95° C., followed by 1 min. at 94° C., 45 sec at 53° C., and 30 sec at 72° C. for 40 cycles with a final extension time of 5 min at 72° C. Amplification products can be purified by using Qiagen's PCR purification kit (No. 28106) according to manufacturer's instructions. The elution of the purified products from the column can be done in 50 µl TE-buffer (10 mM Tris, 1 mM EDTA, pH 7.5).

[0278] The purified amplification products were immobilized via a biotin-avidin linkage to streptavidin-coated beads and the double-stranded DNA was denatured. A detection primer was then annealed to the immobilized DNA using conditions such as, for example, the following: 50 µl annealing buffer (20 mM Tris, 10 mM KCl, 10 mM (NH₄)₂SO₄, 2 mM MgSO₄, 1% Triton X-100, pH 8) at 50° C. for 10 min, followed by washing of the beads three times with 200 µl washing buffer (40 mM Tris, 1 mM EDTA, 50 mM NaCl, 0.1% Tween 20, pH 8.8) and once in 200 µl TE buffer.

[0279] The PROBE extension reaction was performed, for example, by using some components of the DNA sequencing kit from USB (No. 70770) and dNTPs or ddNTPs from Pharmacia. An exemplary protocol could include a total reaction volume of 45 µl, containing of 21 µl water, 6 µl Sequenase-buffer, 3 µl 10 mM DTT solution, 4.5 µl, 0.5 mM of three dNTPs, 4.5 µl, 2 mM the missing one ddNTP, 5.5 µl glycerol enzyme dilution buffer, 0.25 µl Sequenase 2.0,

and 0.25 pyrophosphatase. The reaction can then be pipetted on ice and incubated for 15 min at room temperature and for 5 min at 37° C. The beads can be washed three times with 200 μ l washing buffer and once with 60 μ l of a 70 mM NH₄-Citrate solution.

[0280] The DNA was denatured to release the extended primers from the immobilized template. Each of the resulting extension products was separately analyzed by MALDI-TOF mass spectrometry using 3-hydroxypicolinic acid (3-HPA) as matrix and a UV laser.

[0281] Specifically, the primers used in the PROBE reactions are as shown below: P21/31-3 (SEQ ID NO: 12) for PROBE analysis of the p21 polymorphic site; P53/72 (SEQ ID NO: 4) for PROBE analysis of the p53 polymorphic site; and LPL-2 for PROBE analysis of the lipoprotein lipase

also provided (i.e., 5734.8 Da for the wild-type product and 5405.6 Da for the polymorphic product).

[0283] In the PROBE analysis of the lipoprotein lipase gene polymorphic site, the extension reaction was performed using a mixture of ddA and ddT. The products resulting from the reaction conducted on a “wild-type” allele template (wherein codon 291 encodes an asparagine) and from the reaction conducted on a polymorphic N291S allele template (wherein codon 291 encodes a serine) are shown below and designated as 291Asn and 291Ser, respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are also provided (i.e., 6438.2 Da for the wild-type product and 6758.4 Da for the polymorphic product).

[0284] P53-1 (R72P)

```

PCR Product length: 407 bp

                                U54-p53-ex4-F
                                ctg aggaacctggg cctctgactg (SEQ ID NO: 1)

ctctttttcac ccatctacagttcccccttgccgtcccaagg aatggatgatattgatcgtgt

ggcgggacga tattgaacaa tggttcactg aagaccacagg tccagatgaa gctcccaaga
P53/72          72R
tgccagagggtgctccccgc gtggcccttg caccagcagc tectacacgg ggggcccctg

c 72P
caccagcccc ctctcggccc ctgtcatctt ctgtcccttc ccagaaaaac taccagggga

gtcacggttt ccgtctgggc ttcttgcatc ctgggcacgc caagtctgtg acttgcacgg

tcagttgcgc tgaggggctg gcttccatga gacttcaa
                                U55-p53/2-4R

Primers (SEQ ID NOs: 2-4)
p53-ex4FUS4 ccacgtcacgagttgtaaaacgc tga gga cct ggt cct ctg ac

U55P53/4R agcggtataacaatttcacacagct tga agt ctc atg gaa gcc

P53/72      gcc aga ggc tgc tcc cc

```

gene polymorphic site. In the PROBE analysis of the p21 polymorphic site, the extension reaction was performed using dideoxy-C. The products resulting from the reaction conducted on a “wild-type” allele template (wherein codon 31 encodes a serine) and from the reaction conducted on a polymorphic S31R allele template (wherein codon 31 encodes an arginine) are shown below and designated as P21/31-3 Ser (wt) (SEQ ID NO: 13) and P21/31-3 Arg (SEQ ID NO: 14), respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are also provided (i.e., 4900.2 Da for the wild-type product and 5213.4 Da for the polymorphic product).

[0282] In the PROBE analysis of the p53 polymorphic site, the extension reaction was performed using dideoxy-C. The products resulting from the reaction conducted on a “wild-type” allele template (wherein codon 72 encodes an arginine) and from the reaction conducted on a polymorphic R72P allele template (wherein codon 72 encodes a proline) are shown below and designated as Cod72 G Arg (wt) and Cod72 C Pro, respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are

[0285]

Allele	Masses			
	Product Termination: ddC	SEQ #	Length	Mass
P53/72	gcacagaggtctcccc	5	17	5132.4
Cod72 G Arg	gcacagaggtctccccgc	6	19	5734.8
(wt)				
Cod72 C Pro	gcacagaggtctcccccc	7	18	5405.6

[0286] Biotinylated US5 primer is used in the PCR amplification.

[0287] LPL-1 (N291S)

[0288] Amino acid exchange asparagine to serine at codon 291 of the lipoprotein lipase gene.

PCR Product length: 251 bp
US4-LPL-F2 (SEQ ID NO: 16)
gcgcctccatt catctcttca togcactctct gttagaatgaa gaaaatccaa gtaaggcccta (SEQ ID NO: 15)

cagggtgcagt tccaaaggaag ccttttgagaa agggctctgc ttgagttgta gaaagaaccg
LPL-2 291N

ctgcacaactctgggctatgagatcaataa agtcagagcc aaaagaagca gcaaaatgta
g 291S

cctgaagact cgttctcaga tgccc
US4-LPL-R2

Primers (SEQ ID NOs: 16-18):
US4-LPL-F2 cccagtcacgacgcttgtaaaaacgg cgc tcc att cat ctc ttc
US5-LPL-R2 agcggataacaatttcacacaggg ggc atc tga gaa cga gtc

LPL-2 cea tct ggg cta tga gat ca

[0289]

[0291]

Masses				
Allele	Product Termination: ddA, ddT	SEQ #	Length	Mass
LPL-2	caatctgggctatgagatac	19	20	6141
291 Asn	caatctgggctatgagatac	20	21	6438.2
291 Ser	caatctgggctatgagatcgt	21	22	6758.4

Masses				
Allele	Product Termination: ddC	SEQ #	Length	Mass
P21/31-3	cagcgagcagcigag	12	15	4627
P21/31-3 Ser	cagcgagcagcigagc	13	16	4900.2
(wt)				
P21/31-3 Arg	cagcgagcagcigagac	14	17	5213.4

[0290] Biotinylated US5 primer is used in the PCR amplification.

P21-1 (S31R)
Amino acid exchange serine to arginine at codon 31 of the tumor suppressor gene p21. Product length: 207 bp
US4p21c31-2F

gtcc gtcagaaccc atgcg- (SEQ ID NO: 8)
gcagc
p21/31-3 31S

aaggcctgcc ccgcctctt cggcccagtg gacagcgaacagctgagccg cgaactgtgat
a 31R

gcgcataatgg cgggctgcat ccaggaggcc cgtgagcgat ggaacttoga ctttgtcacc

gagacaccac tggaggg
US5p21-2R

Primers (SEQ ID NOs: 9-11)
US4p21c31-2F cccagtcacgacgcttgtaaaaacgg tcc gtc aga acc cat gcg g
US5p21-2R agcggataacaatttcacacaggc tcc agt ggt gtc tcg gtg ac
P21/31-3 cag cga gca gct gag

[0292] Biotinylated US5 primer is used in the PCR amplification.

[0293] Each of the Caucasian subject DNA samples was individually analyzed by MALDI-TOF mass spectrometry to determine the identity of the nucleotide at the polymorphic sites. The genotypic results of each assay can be entered into the database. The results were then sorted according to age and/or sex to determine the distribution of allelic frequencies by age and/or sex. As depicted in the Figures showing histograms of the results, in each case, there was a differential distribution of the allelic frequencies of the genetic markers for the p21, p53 and lipoprotein lipase gene polymorphisms.

[0294] FIG. 8 shows the results of the p21 genetic marker assays and reveals a statistically significant decrease (from 13.3% to 9.2%) in the frequency of the heterozygous genotype (S31 R) in Caucasians with age (18-49 years of age compared to 50-79 years of age). The frequencies of the homozygous (S31 and R31) genotypes for the two age groups are also shown, as are the overall frequencies of the S31 and R31 alleles in the two age groups (designated as *S31 and *R31, respectively in the Figure).

[0295] FIGS. 7A-C show the results of the p53 genetic marker assays and reveals a statistically significant decrease (from 6.7% to 3.7%) in the frequency of the homozygous polymorphic genotype (P72) in Caucasians with age (18-59 years of age compared to 60-79 years of age). The frequencies of the homozygous "wild-type" genotype (R72) and the heterozygous genotype (R72P) for the two age groups are also shown, as are the overall frequencies of the R72 and P72 alleles in the two age groups (designated as *R72 and *P72, respectively in the Figure). These results are consistent with the observation that allele is not benign, as p53 regulates expression of a second protein, p21, which inhibits cyclin-dependent kinases (CDKs) needed to drive cells through the cell-cycle (a mutation in either gene can disrupt the cell cycle leading to increased cell division).

[0296] FIG. 2C shows the results of the lipoprotein lipase gene genetic marker assays and reveals a statistically significant decrease (from 1.97% to 0.54%) in the frequency of the polymorphic allele (S291) in Caucasian males with age (see also Reymer et al. (1995) *Nature Genetics* 10:28-34). The frequencies of this allele in Caucasian females of different age groups are also shown.

EXAMPLE 2

[0297] This example describes the use of MALDI-TOF mass spectrometry to analyze DNA samples of a number of subjects as individual samples and as pooled samples of multiple subjects to assess the presence or absence of a polymorphic allele (the 353Q allele) of the Factor VII gene and determine the frequency of the allele in the group of subjects. The results of this study show that essentially the same allelic frequency can be obtained by analyzing pooled DNA samples as by analyzing each sample separately and thereby demonstrate the quantitative nature of MALDI-TOF mass spectrometry in the analysis of nucleic acids.

[0298] Factor VII

[0299] Factor VII is a serine protease involved in the extrinsic blood coagulation cascade. This factor is activated by thrombin and works with tissue factor (Factor III) in the

processing of Factor X to Factor Xa. There is evidence that supports an association between polymorphisms in the Factor VII gene and increased Factor VII activity which can result in an elevated risk of ischemic cardiovascular disease, including myocardial infarction. The polymorphism investigated in this study is R353Q (i.e., a substitution of a glutamic acid residue for an arginine residue at codon 353 of the Factor VII gene) (see Table 5).

[0300] Analysis of DNA Samples for the Presence or Absence of the 353Q Allele of the Factor VII Gene

[0301] Genomic DNA was isolated from separate blood samples obtained from a large number of subjects divided into multiple groups of 92 subjects per group. Each sample of genomic DNA was analyzed using the BiomassPROBE™ assay as described in Example 1 to determine the presence or absence of the 353Q polymorphism of the Factor VII gene.

[0302] First, DNA from each sample was amplified in a polymerase chain reaction using primers F7-353FUS4 (SEQ ID NO: 24) and F7-353RUS5 (SEQ ID NO: 26) as shown below and using standard conditions, for example, as described in Example 1. One of the primers was biotinylated to permit immobilization of the amplification product to a solid support. The purified amplification products were immobilized via a biotin-avidin linkage to streptavidin-coated beads and the double-stranded DNA was denatured. A detection primer was then annealed to the immobilized DNA using conditions such as, for example, described in Example 1. The detection primer is shown as F7-353-P (SEQ ID NO: 27) below. The PROBE extension reaction was carried out using conditions, for example, such as those described in Example 1. The reaction was performed using ddG.

[0303] The DNA was denatured to release the extended primers from the immobilized template. Each of the resulting extension products was separately analyzed by MALDI-TOF mass spectrometry. A matrix such as 3-hydroxypicolinic acid (3-HPA) and a UV laser could be used in the MALDI-TOF mass spectrometric analysis. The products resulting from the reaction conducted on a "wild-type" allele template (wherein codon 353 encodes an arginine) and from the reaction conducted on a polymorphic 353Q allele template (wherein codon 353 encodes a glutamic acid) are shown below and designated as 353 CGG and 353 CAG, respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are also provided (i.e., 5646.8 Da for the wild-type product and 5960 Da for the polymorphic product).

[0304] The MALDI-TOF mass spectrometric analyses of the PROBE reactions of each DNA sample were first conducted separately on each sample (250 nanograms total concentration of DNA per analysis). The allelic frequency of the 353Q polymorphism in the group of 92 subjects was calculated based on the number of individual subjects in which it was detected.

[0305] Next, the samples from 92 subjects were pooled (250 nanograms total concentration of DNA in which the concentration of any individual DNA is 2.7 nanograms), and the pool of DNA was subjected to MALDI-TOF mass spectrometric analysis. The area under the signal corresponding to the mass of the 353Q polymorphism PROBE

extension product in the resulting spectrum was integrated in order to quantitate the amount of DNA present. The ratio of this amount to total DNA was used to determine the allelic frequency of the 353Q polymorphism in the group of subjects. This type of individual sample vs. pooled sample analysis was repeated for numerous different groups of 92 different samples.

[0306] The frequencies calculated based on individual MALDI-TOF mass spectrometric analysis of the 92 separate samples of each group of 92 are compared to those calculated based on MALDI-TOF mass spectrometric analysis of pools of DNA from 92 samples in FIG. 9. These comparisons are shown as "pairs" of bar graphs in the Figure, each pair being labeled as a separate "pool" number, e.g., P1, P16, P2, etc. Thus, for example, for P1, the allelic frequency of the polymorphism calculated by separate analysis of each of the 92 samples was 11.41%, and the frequency calculated by analysis of a pool of all of the 92 DNA samples was 12.09%.

[0307] The similarity in frequencies calculated by analyzing separate DNA samples individually and by pooling the DNA samples demonstrates that it is possible, through the quantitative nature of MALDI-TOF mass spectrometry, to analyze pooled samples and obtain accurate frequency determinations. The ability to analyze pooled DNA samples significantly reduces the time and costs involved in the use of the non-selected, healthy databases as described herein. It has also been shown that it is possible to decrease the DNA concentration of the individual samples in a pooled mixture from 2.7 nanograms to 0.27 nanograms without any change in the quality of the spectrum or the ability to quantitate the amount of sample detected.

[0308] Factor VII R353Q PROBE Assay

[0309] PROBE Assay for cod353 CGG>CAG (Arg>Gln), Exon 9 G>A.

PCR fragment: 134 bp (incl. US tags; SEQ ID Nos. 22 and 23)
Frequency of A allele: Europeans about 0.1, Japanese/Chinese about 0.03-0.05 (Thromb. Haemost. 1995, 73:617-22; Diabetologia 1996, 41:760-6):

F7-353FUS4>
1201 GTGCCGGCTA CTCGGATGGCAGCAGGACTCCTGSCAAGGG GGACAGTGGGA GGCCCACTAG

F7-353-P> A <F7-353RUS5
1261 CCACCCACTACCGGGGCAG TGGTACCTGACGGGCATCTGACCTGGGGC CAGGGCTGCG

Primers (SEQ ID Nos. 24-26) Tm⁶⁸
F7-353FUS4 CCC AGT CAC GAC GTT GTA AAA CGA TGG CAG CAA GGA CTC CTG 64° C.

F7-353-P CAC ATG CCA CCC ACT ACC

F7-353RUS5 AGC GGA TAA CAA TTT CAC ACA GGT GAC GAT GCC CGT CAG GTA 64° C.
C

[0310]

Masses				
Allele	Product Termination: ddG	SEQ #	Length	Mass
F7-353-P	atgcaccactacc	27	18	5333.6
353 CGG	cacatgcaccactaccg	28	19	5646.8

-continued

Masses				
Allele	Product Termination: ddG	SEQ #	Length	Mass
353 CAG	caatgcaccactaccg	29	20	5960
US5-bio bio-	agcggatacaantttcacagg	30	23	7648.6

[0311] Conclusion

[0312] The above examples demonstrate an effect of altered frequency of disease causing genetic factors within the general population. Interpretation of those results allows prediction of the medical relevance of polymorphic genetic alterations. In addition, conclusions can be drawn with regard to their penetrance, diagnostic specificity, positive predictive value, onset of disease, most appropriate onset of preventive strategies, and the general applicability of genetic alterations identified in isolated populations to panmixed populations. Therefore, an age- and sex-stratified population-based sample bank that is ethnically homogenous is a suitable tool for rapid identification and validation of genetic factors regarding their potential medical utility.

EXAMPLE 3

[0313] Morbidity and Mortality Markers

[0314] Sample Band and Initial Screening

[0315] Healthy samples were obtained through the blood bank of San Bernardino, Calif. Donors signed prior to the blood collection a consent form and agreed that their blood will be used in genetic studies with regard to human aging. All samples were anonymized. Tracking back of samples is not possible.

[0316] Isolation of DNA from Blood Samples of a Healthy Donor Population

[0317] Blood is obtained from a donor by venous puncture and preserved with 1 mM EDTA pH 8.0. Ten milliliters of whole blood from each donor was centrifuged at 2000xg. One milliliter of the buffy coat was added to 9 milliliters of 155 mM NH₄Cl, 1 mM KHCO₃, and 0.1 mM Na₂EDTA, incubated 10 minutes at room temperature and centrifuged for 10 minutes at 2000xg. The supernatant was removed, and the white cell pellet was washed in 155 mM NH₄Cl, 10

mM KHCO_3 , and 0.1 mM Na_2EDTA and resuspended in 4.5 milliliters of 50 mM Tris, 5 mM EDTA, and 1% SDS. Proteins were precipitated from the cell lysate by 6M Ammonium Acetate, pH 7.3, and separated from the nucleic acid by centrifugation 3000xg. The nucleic acid was recovered from the supernatant by the addition of an equal volume of 100% isopropanol and centrifugation at 2000xg. The dried nucleic acid pellet was hydrated in 10mM Tris pH 7.6 and 1 mM Na_2EDTA and stored at 4°C.

[0318] In this study, samples were pooled as shown in Table 1. Both parents of the blood donors were of Caucasian origin.

TABLE 1

Pool ID	Sex	Age-range	# individuals
SP1	Female	18–39 years	276
SP2	Males	18–39 years	276
SP3	Females	60–69 years	184
SP4	Males	60–79 years	368

[0319] More than 400 SNPs were tested using all four pools. After one test run 34 assays were selected to be re-assayed at least once. Finally, 10 assays showed repeatedly differences in allele frequencies of several percent and, therefore, fulfilled the criteria to be tested using the individual samples. Average allele frequency and standard deviation is tabulated in Table 2.

TABLE 2

Assay ID	SP1	SP1-STD	SP2	SP2-STD	SP3	SP3-STD	SP4	SP4-STD
47861	0.457	0.028	0.433	0.042	0.384	0.034	0.380	0.015
47751	0.276	0.007	0.403	0.006	0.428	0.052	0.400	0.097
48319	0.676	0.013	0.627	0.018	0.755	0.009	0.686	0.034
48070	0.581	0.034	0.617	0.045	0.561	n.a.	0.539	0.032
49807	0.504	0.034	0.422	0.020	0.477	0.030	0.556	0.005
49534	0.537	0.017	0.503	n.a.	0.623	0.023	0.535	0.009
49733	0.560	0.006	0.527	0.059	0.546	0.032	0.436	0.016
49947	0.754	0.008	0.763	0.047	0.736	0.052	0.689	0.025
50128	0.401	0.022	0.363	0.001	0.294	0.059	0.345	0.013
63306	0.697	0.012	0.674	0.013	0.712	0.017	0.719	0.005

[0320] So far, 7 out of the 10 potential morbidity markers were fully analyzed. Additional information about genes in which these SNPs are located was gathered through publicly available databases, including Genbank.

[0321] AKAPS

[0322] Candidate morbidity and mortality markers include housekeeping genes, such as genes involved in signal transduction. Among such genes are the A-kinase anchoring proteins (AKAPs) genes, which participate in signal transduction pathways involving protein phosphorylation. Protein phosphorylation is an important mechanism for enzyme regulation and the transduction of extracellular signals across the cell membrane in eukaryotic cells. A wide variety of cellular substrates, including enzymes, membrane receptors, ion channels and transcription factors, can be phosphorylated in response to extracellular signals that interact with cells. A key enzyme in the phosphorylation of cellular proteins in response to hormones and neurotransmitters is cyclic AMP (cAMP)-dependent protein kinase (PKA). Upon

activation by cAMP, PKA thus mediates a variety of cellular responses to such extracellular signals. An array of PKA isozymes are expressed in mammalian cells. The PKAs usually exist as inactive tetramers containing a regulatory (R) subunit dimer and two catalytic (C) subunits. Genes encoding three C subunits (C α , C β and C γ) and four R subunits (RI α , RI β , RII α and RII β) have been identified [see Takio et al. (1982) *Proc. Natl. Acad. Sci. U.S.A.* 79:2544-2548; Lee et al. (1983) *Proc. Natl. Acad. Sci. U.S.A.* 80:3608-3612; Jahnsen et al. (1996) *J. Biol. Chem.* 261:12352-12361; Clegg et al. (1988) *Proc. Natl. Acad. Sci. U.S.A.* 85:3703-3707; and Scott (1991) *Pharmacol. Ther.* 50:123-145]. The type I (RI) α and type II (RII) α subunits are distributed ubiquitously, whereas RI β and RII β are present mainly in brain [see, e.g., Miki and Eddy (1999) *J. Biol. Chem.* 274:29057-29062]. The type I PKA holoenzyme (RI α and RI β) is predominantly cytoplasmic, whereas the majority of type II PKA (RII α and RII β) associates with cellular structures and organelles [Scott (1991) *Pharmacol. Ther.* 50:123-145]. Many hormones and other signals act through receptors to generate cAMP which binds to the R subunits of PKA and releases and activates the C subunits to phosphorylate proteins. Because protein kinases and their substrates are widely distributed throughout cells, there are mechanisms in place in cells to localize protein kinase-mediated responses to different signals. One such mechanism involves subcellular targeting of PKAs through association with anchoring proteins, referred to as A-kinase anchoring proteins (AKAPs), that place PKAs in

close proximity to specific organelles or cytoskeletal components and particular substrates thereby providing for more specific PKA interactions and localized responses [see, e.g., Scott et al. (1990) *J. Biol. Chem.* 265:21561-21566; Bregman et al. (1991) *J. Biol. Chem.* 266:7207-7213; and Miki and Eddy (1999) *J. Biol. Chem.* 274:29057-29062]. Anchoring not only places the kinase close to the substrates, but also positions the PKA holoenzyme at sites where it can optimally respond to fluctuations in the second messenger cAMP [Mochly-Rosen (1995) *Science* 268:247-251; Faux and Scott (1996) *Trends Biochem. Sci.* 21:312-315; Hubbard and Cohen (1993) *Trends Biochem. Sci.* 18:172-177].

[0323] Up to 75% of type II PKA is localized to various intracellular sites through association of the regulatory subunit (RII) with AKAPs [see, e.g., Hausken et al. (1996) *J. Biol. Chem.* 271:29016-29021]. RII subunits of PKA bind to AKAPs with nanomolar affinity [Carr et al. (1992) *J. Biol. Chem.* 267:13376-13382], and many AKAP-RII complexes have been isolated from cell extracts. RI subunits of PKA bind to AKAPs with only micromolar affinity [Burton et al.

(1997) *Proc. Natl. Acad. Sci. U.S.A.* 94:11067-110721. Evidence of binding of a PKA RI subunit to an AKAP has been reported [Miki and Eddy (1998) *J. Biol. Chem.* 273:34384-34390] in which RI α -specific and RI α /RI β dual specificity PKA anchoring domains were identified on FSC1/AKAP82. Additional dual specific AKAPs, referred to as D-AKAP1 and D-AKAP2, which interact with the type I and type II regulatory subunits of PKA have also been reported [Huang et al. (1997) *J. Biol. Chem.* 272:8057-8064; Huang et al. (1997) *Proc. Natl. Acad. Sci. U.S.A.* 94:11184-11189].

[0324] More than 20 AKAPs have been reported in different tissues and species. Complementary DNAs (cDNAs) encoding AKAPs have been isolated from diverse species, ranging from *Caenorhabditis elegans* and *Drosophila* to human [see, e.g., Colledge and Scott (1999) *Trends Cell Biol.* 9:216-221]. Regions within AKAPs that mediate association with RI subunits of PKA have been identified. These regions of approximately 10-18 amino acid residues vary substantially in primary sequence, but secondary structure predictions indicate that they are likely to form an amphipathic helix with hydrophobic residues aligned along one face of the helix and charged residues along the other [Carr et al. (1991) *J. Biol. Chem.* 266:14188-14192; Carr et al. (1992) *J. Biol. Chem.* 267:13376-13382]. Hydrophobic amino acids with a long aliphatic side chain, e.g., valine, leucine or isoleucine, can participate in binding to RI subunits [Glantz et al. (1993) *J. Biol. Chem.* 268:12796-12804].

[0325] Many AKAPs also have the ability to bind to multiple proteins, including other signaling enzymes. For example, AKAP79 binds to PKA, protein kinase C (PKC) and the protein phosphatase calcineurin (PP2B) [Coghlan et al. (1995) *Science* 267:108-112 and Klauk et al. (1996) *Science* 271:1589-1592]. Therefore, the targeting of AKAP79 to neuronal postsynaptic membranes brings together enzymes with opposite catalytic activities in a single complex.

[0326] AKAPs thus serve as potential regulatory mechanisms that increase the selectivity and intensity of a cAMP-mediated response. There is a need, therefore, to identify and elucidate the structural and functional properties of AKAPs in order to gain a complete understanding of the important role these proteins play in the basic functioning of cells.

[0327] AKAP10

[0328] The sequence of a human AKAP10 cDNA (also referred to as D-AKAP2) is available in the GenBank database, at accession numbers AF037439 (SEQ ID NO: 31) and NM 007202. The AKAP10 gene is located on chromosome 17.

[0329] The sequence of a mouse D-AKAP2 cDNA is also available in the GenBank database (see accession number AF021833). The mouse D-AKAP2 protein contains an RGS domain near the amino terminus that is characteristic of proteins that interact with G α subunits and possess GTPase activating protein-like activity [Huang et al. (1997) *Proc. Natl. Acad. Sci. U.S.A.* 94:11184-11189]. The human AKAP10 protein also has sequences homologous to RGS domains. The carboxy-terminal 40 residues of the mouse D-AKAP2 protein are responsible for the interaction with the regulatory subunits of PKA. This sequence is fairly well conserved between the mouse D-AKAP2 and human AKAP10 proteins.

[0330] Polymorphisms of the Human AKAP10 Gene and Polymorphic AKAP10 Proteins

[0331] Polymorphisms of AKAP genes that alter gene expression, regulation, protein structure and/or protein function are more likely to have a significant effect on the regulation of enzyme (particularly PKA) activity, cellular transduction of signals and responses thereto and on the basic functioning of cells than polymorphisms that do not alter gene and/or protein function. Included in the polymorphic AKAPs provided herein are human AKAP10 proteins containing differing amino acid residues at position number 646.

[0332] Amino acid 646 of the human AKAP10 protein is located in the carboxy-terminal region of the protein within a segment that participates in the binding of R-subunits of PKAs. This segment includes the carboxy-terminal 40 amino acids.

[0333] The amino acid residue reported for position 646 of the human AKAP10 protein is an isoleucine. Polymorphic human AKAP10 proteins provided herein have the amino acid sequence but contain residues other than isoleucine at amino acid position 646 of the protein. In particular embodiments of the polymorphic human AKAP10 proteins provided herein, the amino acid at position 646 is a valine, leucine or phenylalanine residue.

[0334] An A to G Transition at Nucleotide 2073 of the Human AKAP10 Coding Sequence

[0335] As described herein, an allele of the human AKAP10 gene that contains a specific polymorphism at position 2073 of the coding sequence and thereby encodes a valine at position 646 has been detected in varying frequencies in DNA samples from younger and older segments of the human population. In this allele, the A at position 2073 of the AKAP10 gene coding sequence is changed from an A to a G, giving rise to an altered sequence in which the codon for amino acid 646 changes from ATT, coding for isoleucine, to GTT, coding for valine.

[0336] Morbidity Marker 1: Human Protein Kinase A Anchoring Protein (AKAP10-1)

[0337] PCR Amplification and BiomassPROBE assay detection of AKAP10-1 in a healthy donor population

[0338] PCR Amplification of Donor Population for AKAP 10

[0339] PCR primers were synthesized by OPERON using phosphoramidite chemistry. Amplification of the AKAP10 target sequence was carried out in single 50 μ l PCR reaction with 100 ng-1 μ g of pooled human genomic DNAs in a 50 μ l PCR reaction. Individual DNA concentrations within the pooled samples were present in equal concentration with the final concentration ranging from 1-25 ng. Each reaction containing IX PCR buffer (Qiagen, Valencia, Calif.), 200 μ M dNTPs, 1U Hotstar Taq polymerase (Qiagen, Valencia, Calif.), 4 mM MgCl₂, and 25 pmol of the forward primer containing the universal primer sequence 5'-TCTCAATCATGTGCATTGAGG-3' (SEQ ID NO: 45), 2 pmol of the reverse primer 5'-AGCGGATAACAATTTCACACAGGGATCACA-CAGCCATTCAGAG-3' (SEQ ID NO: 46), and 10 pmol of a biotinylated universal primer complementary to the 5' end of the PCR amplicon 5'-AGCGGATAACAATTTCACA-

CAGG-3'(SEQ ID NO: 47). After an initial round of amplification with the target with the specific forward and reverse primer, the 5' biotinylated universal primer then hybridized and acted as a reverse primer thereby introducing a 3' biotin capture moiety into the molecule. The amplification protocol results in a 5'-biotinylated double stranded DNA amplicon and dramatically reduces the cost of high throughput genotyping by eliminating the need to 5' biotin label each forward primer used in a genotyping. Thermal cycling was performed in 0.2 mL tubes or 96 well plate using an MJ Research Thermal Cycler (calculated temperature) with the following cycling parameters: 94° C. for 5 min; 45 cycles: 94° C. for 20 sec, 56° C. for 30 sec, 72° C. for 60 sec; 72° C. 3 min.

[0340] Immobilization of DNA

[0341] The 50 μ L PCR reaction was added to 25 μ L of streptavidin coated magnetic bead (Dyna) prewashed three times and resuspended in 1M NH_4Cl , 0.06M NH_4OH . The PCR amplicons were allowed to bind to the beads for 15 minutes at room temperature. The beads were then collected with a magnet and the supernatant containing unbound DNA was removed. The unbound strand was released from the double stranded amplicons by incubation in 100 mM NaOH and washing of the beads three times with 10 mM Tris pH 8.0.

[0342] BiomassPROBE Assay Analysis of Donor Population for AKAP10-1 (clone 48319)

[0343] Genotyping using the BiomassPROBE assay methods was carried out by resuspending the DNA coated magnetic beads in 26 mM Tris-HCl pH 9.5, 6.5 mM MgCl_2 , and 50 mM each of dTTP and 50 mM each of ddCTP, ddATP, ddGTP, 2.5U of a thermostable DNA polymerase (Amersham) and 20 pmol of a template specific oligonucleotide PROBE primer 5'-CTGGCGCCACGTGGTCAA-3' (SEQ ID NO: 48) (Operon). Primer extension occurs with three cycles of oligonucleotide primer hybridization and extension. The extension products were analyzed after denaturation from the template with 50 mM NH_4Cl and transfer of 150 nL each sample to a silicon chip preloaded with 150 nL of H3PA matrix material. The sample material was allowed to crystallize and was analyzed by MALDI-TOF (Bruker, PerSeptive). The SNP that is present in AKAP10-1 is a T to C transversion at nucleotide number 156277 of the sequence of a genomic clone of the AKAP10 gene (GenBank Accession No. AC005730) (SEQ ID NO: 36). SEQ ID NO: 35: represents the nucleotide sequence of human chromosome 17, which contains the genomic nucleotide sequence of the human AKAP10 gene, and SEQ ID NO: 36 represents the nucleotide sequence of human chromosome 17, which contains the genomic nucleotide sequence of the human AKAP10-1 allele. The mass of the primer used in the BioMass probe reaction was 5500.6 daltons. In the presence of the SNP, the primer is extended by the addition of ddC, which has a mass of 5773.8. The wildtype gene results in the addition of dT and ddG to the primer to produce an extension product having a mass of 6101 daltons.

[0344] The frequency of the SNP was measured in a population of age selected healthy individuals. Five hundred fifty-two (552) individuals between the ages of 18-39 years (276 females, 276 males) and 552 individuals between the ages of 60-79 (184 females between the ages of 60-69, 368 males between the age of 60-79) were tested for the presence

of the polymorphism localized in the non-translated 3' region of AKAP 10. Differences in the frequency of this polymorphism with increasing age groups were observed among healthy individuals. Statistical analysis showed that the significance level for differences in the allelic frequency for alleles between the "younger" and the "older" populations was $p=0.0009$ and for genotypes was $p=0.003$. Differences between age groups are significant. For the total population allele significance is $p=0.0009$, and genotype significance is $p=0.003$.

[0345] This marker led to the best significant result with regard to allele and genotype frequencies in the age-stratified population. FIG. 19 shows the allele and genotype frequency in both genders as well as in the entire population. For the latter, the significance for alleles was $p=0.0009$ and for genotypes was $p=0.003$. The young and old populations were in Hardy-Weinberg equilibrium. A preferential change of one particular genotype was not observed.

[0346] The polymorphism is localized in the non-translated 3'-region of the gene encoding the human protein kinase A anchoring protein (AKAP10). The gene is located on chromosome 17. Its structure includes 15 exons and 14 intervening sequences (introns). The encoded protein is responsible for the sub-cellular localization of the cAMP-dependent protein kinase and, therefore, plays a key role in the G-protein mediated receptor-signaling pathway (Huang et al. PNAS (1007) 94:11184-11189). Since its localization is outside the coding region, this polymorphism is most likely in linkage disequilibrium (LD) with other non-synonymous polymorphisms that could cause amino acid substitutions and subsequently alter the function of the protein. Sequence comparison of different Genbank database entries concerning this gene revealed further six potential polymorphisms of which two are supposed to change the respective amino acid (see Table 3).

TABLE 3

Exon	Codon	Nucleotides	Amino acid
3	100	GCT > GCC	Ala > Ala
4	177	AGT > GTG	Met > Val
8	424	GGG > GGC	Gly > Gly
10	524	CCG > CTG	Phe > Leu
12	591	GTG > GTC	Val > Val
12	599	CGC > CGA	Arg > Arg

[0347] Morbidity Marker 2: Human Protein Kinase A Anchoring Protein (AKAP10-5)

[0348] Discovery of AKAP10-5 Allele (SEQ ID NO: 33)

[0349] Genomic DNA was isolated from blood (as described above) of seventeen (17) individuals with a genotype CC at the AKAP10-1 gene locus and a single heterozygous individual (CT) (as described). A target sequence in the AKAP10-1 gene which encodes the C-terminal PKA binding domain was amplified using the polymerase chain reaction. PCR primers were synthesized by OPERON using phosphoramidite chemistry. Amplification of the AKAP10-1 target sequence was carried out in individual 50 μ L PCR reaction with 25 ng of human genomic DNA templates. Each reaction containing 1xPCR buffer (Qiagen, Valencia, Calif.), 200 μ M dNTPs, 1U Hotstar Taq polymerase (Qiagen, Valencia, Calif.), 4 mM MgCl_2 , 25 pmol of the forward primer

(Ex13F) containing the universal primer sequence and the target specific sequence 5'-TCC CAA AGT GCT GGA ATT AC-3' (SEQ ID NO: 53), and 2 pmol of the reverse primer (Ex14R) 5'-GTC CAA TAT ATG CAAACA GTT G-3' (SEQ ID NO: 54). Thermal cycling was performed in 0.2 mL tubes or 96 well plate using an MJ Research Thermal Cycler (MJ Research, Waltham, Mass.) (calculated temperature) with the following cycling parameters: 94° C. for 5 min; 45 cycles; 94° C. for 20 sec, 56° C. for 30 sec, 72° C. for 60 sec; 72° C. 3 min. After amplification the amplicons were purified using a chromatography (Mo Bio Laboratories (Solana Beach, Calif.)).

[0350] The sequence of the 18 amplicons, representing the target region, was determined using a standard Sanger cycle sequencing method with 25 nmol of the PCR amplicon, 3.2 mM DNA sequencing primer 5'-CCC ACA GCA GTT AAT CCT TC-3' (SEQ ID NO: 55), and chain terminating dRhodamine labeled 2', 3' dideoxynucleotides (PE Biosystems, Foster City, Calif.) using the following cycling parameters: 96° C. for 15 seconds; 25 cycles: 55° C. for 15 seconds, 60° C. for 4 minutes. The sequencing products precipitated by 0.3M NaOAc and ethanol. The precipitate was centrifuged and dried. The pellets were resuspended in deionized formamide and separated on a 5% polyacrylimide gel. The sequence was determined using the "Sequencher" software (Gene Codes, Ann Arbor, Mich.).

[0351] The sequence of all 17 of the amplicons, which are homozygous for the AKAP10-1 SNP of the amplicons, revealed a polymorphism at nucleotide position 152171 (numbering for GenBank Accession No. AC005730 for AKAP10 genomic clone (SEQ ID NO: 35)) with A replaced by G. This SNP also can be designated as located at nucleotide 2073 of a cDNA clone of the wildtype AKAP10 (GenBank Accession No. AF037439) (SEQ ID NO: 31). The amino acid sequence of the human AKAP10 protein is provided as SEQ ID NO: 34. This single nucleotide polymorphism was designated as AKAP10-5 (SEQ ID NO: 33) and resulted in a substitution of a valine for an isoleucine residue at amino acid position 646 of the amino acid sequence of human AKAP10 (SEQ ID NO: 32).

[0352] PCR Amplification and BiomassPROBE Assay Detection of AKAP10-5 in a Healthy Donor Population

[0353] The healthy population stratified by age is a very efficient and a universal screening tool for morbidity associated genes by allowing for the detection of changes of allelic frequencies in the young compared to the old population. Individual samples of this healthy population base can be pooled to further increase the throughput.

[0354] Healthy samples were obtained through the blood bank of San Bernardino, Calif. Both parents of the blood donors were of Caucasian origin. Practically a healthy subject, when human, is defined as human donor who passes blood bank criteria to donate blood for eventual use in the general population. These criteria are as follows: free of detectable viral, bacterial, mycoplasma, and parasitic infections; not anemic; and then further selected based upon a questionnaire regarding history (see FIG. 3). Thus, a healthy population represents an unbiased population of sufficient health to donate blood according to blood bank criteria, and not further selected for any disease state. Typically such individuals are not taking any medications.

[0355] PCR primers were synthesized by OPERON using phosphoramidite chemistry. Amplification of the AKAP10

target sequence was carried out in a single 50 μ L PCR reaction with 100 ng-1 μ g of pooled human genomic DNAs in a 50 μ L PCR reaction. Individual DNA concentrations within the pooled samples were present in equal concentration with the final concentration ranging from 1-25 ng. Each reaction contained 1xPCR buffer (Qiagen, Valencia, Calif.), 200 μ M dNTPs, 1U HotStar Taq polymerase (Qiagen, Valencia, Calif.), 4 mM $MgCl_2$, and 25 pmol of the forward primer containing the universal primer sequence and the target specific sequence 5'-AGCGGATAACAATTTCACACAGGGAGCTAGCTTGGGAAGAT TGC-3' (SEQ ID NO: 41), 2 pmol of the reverse primer 5'-GTCCAATATATGCAACAGTTG-3' (SEQ ID NO: 54), and 10 pmol of a biotinylated universal primer complementary to the 5' end of the PCR amplicon BIO:5'-AGCGGATAACAATTTCACACAGG-3' (SEQ ID NO: 43). After an initial round of amplification with the target with the specific forward and reverse primer, the 5' biotinylated universal primer can then be hybridized and acted as a forward primer thereby introducing a 5' biotin capture moiety into the molecule. The amplification protocol resulted in a 5'-biotinylated double stranded DNA amplicon and dramatically reduced the cost of high throughput genotyping by eliminating the need to 5' biotin label every forward primer used in a genotyping.

[0356] Thermal cycling was performed in 0.2 mL tubes or 96 well plate using an MJ Research Thermal Cycler (calculated temperature) with the following cycling parameters: 94° C. for 5 min; 45 cycles: 94° C. for 20 sec, 56° C. for 30 sec; 72° C. for 60 sec; 72° C. 3 min.

[0357] Immobilization of DNA

[0358] The 50 μ L PCR reaction was added to 25 μ L of streptavidin coated magnetic beads (Dynal, Oslo, Norway), which were prewashed three times and resuspended in 1M NH_4Cl , 0.06M NH_4OH . The 5' end of one strand of the double stranded PCR amplicons were allowed to bind to the beads for 15 minutes at room temperature. The beads were then collected with a magnet, and the supernatant containing unbound DNA was removed. The hybridized but unbound strand was released from the double stranded amplicons by incubation in 100 mM NaOH and washing of the beads three times with 10 mM Tris pH 8.0.

[0359] Detection of AKAP10-5 using BiomassPROBE™ Assay

[0360] BiomassPROBE™ assay of primer extension analysis (see, U.S. Pat. No. 6,043,031) of donor population for AKAP 10-5 (SEQ ID NO: 33) was performed. Genotyping using these methods was carried out by resuspending the DNA coated magnetic beads in 26 mM Tris-HCl pH 9.5, 6.5 mM $MgCl_2$, 50 mM dTTP, 50 mM each of ddCTP, ddATP, ddGTP, 2.5U of a thermostable DNA polymerase (Amersham), and 20 pmol of a template specific oligonucleotide PROBE primer 5'-ACTGAGCCTGCTG-CATAA-3' (SEQ ID NO: 44) (Operon). Primer extension occurs with three cycles of oligonucleotide primer with hybridization and extension. The extension products were analyzed after denaturation from the template with 50 mM NH_4Cl and transfer of 150 nL of each sample to a silicon chip preloaded with 150 nL of H3PA matrix material. The sample material was allowed to crystallize and analyzed by MALDI-TOF (Bruker, PerSeptive). The primer has a mass of 5483.6 daltons. The SNP results in the addition of a ddC to the primer, giving a mass of 5756.8 daltons for the

extended product. The wild type results in the addition a T and ddG to the primer giving a mass of 6101 daltons.

[0361] The frequency of the SNP was measured in a population of age selected healthy individuals. Seven hundred thirteen (713) individuals under 40 years of age (360 females, 353 males) and 703 individuals over 60 years of age (322 females, 381 males) were tested for the presence of the SNP, AKAP10-5 (SEQ ID NO: 33). Results are presented below in Table 4.

TABLE 4

AKAP10-5 (2073V) frequency comparison in 2 age groups					
			<40	>60	delta G allele
Female	Alleles	*G	38.6	34.6	4.0
		*A	61.4	65.4	
	Genotypes	G	13.9	11.8	2.1
		GA	49.4	45.7	
		A	36.7	42.5	
Male	Alleles	*G	41.4	37.0	4.4
		*A	58.6	63.0	
	Genotypes	G	18.4	10.8	7.7
		GA	45.9	52.5	
		A	35.7	36.7	
Total	Alleles	*G	40.0	35.9	4.1
		*A	60.0	64.1	
	Genotypes	G	16.1	11.2	4.9
		GA	47.7	49.4	
		A	36.2	39.4	

[0362] FIG. 20 graphically shows these results of allele and genotype distribution in the age and sex stratified Caucasian population.

[0363] Morbidity Marker 3: Human Methionine Sulfoxide Reductase A (msrA)

[0364] The age-related allele and genotype frequency of this marker in both genders and the entire population is shown in FIG. 21. The decrease of the homozygous CC genotype in the older male population is highly significant.

[0365] Methionine Sulfoxide Reductase A (#63306)

[0366] PCR Amplification and BiomassPROBE assay detection of the human methionine sulfoxide reductase A (h-msr-A) in a healthy donor population

[0367] PCR Amplification of Donor Population for h-msr-A

[0368] PCR primers were synthesized by OPERON using phosphoramidite chemistry. Amplification of the AKAP10 target sequence was carried out in single 50 μ l PCR reaction with 100 ng-1 μ g of pooled human genomic DNA templates in a 50 μ l PCR reaction. Individual DNA concentrations within the pooled samples were present in an equal concentration with the final concentration ranging from 1-25 ng. Each reaction containing 1 X PCR buffer (Qiagen, Valencia, Calif.), 200 μ M dNTPs, 1U Hotstar Taq polymerase (Qiagen, Valencia, Calif.), 4 mM MgCl₂, 25 pmol of the forward primer containing the universal primer sequence and the target specific sequence 5'-TTTCTCTGCACAGAGAGG-3' (SEQ ID NO: 49), 2 pmol of the reverse primer 5'-AGCGGATAACAATTTCACACAGGGCT-GAAATCCTTCGCTTTACC-3' (SEQ ID NO: 50), and 10 pmol of a biotinylated universal primer complementary to the 5' end of the PCR amplicon 5'-AGCGGATAA-

CAATTCACACAGG-3' (SEQ ID NO: 51). After an initial round of amplification of the target with the specific forward and reverse primers, the 5' biotinylated universal primer was then hybridized and acted as a reverse primer thereby introducing a 3' biotin capture moiety into the molecule. The amplification protocol results in a 5'-biotinylated double stranded DNA amplicon and dramatically reduces the cost of high throughput genotyping by eliminating the need to 5' biotin label each forward primer used in a genotyping. Thermal cycling was performed in 0.2 mL tubes or 96 well plate using an MJ Research Thermal Cycler (calculated temperature) with the following cycling parameters: 94° C. for 5 min; 45 cycles: 94° C. for 20 sec, 56° C. for 30 sec, 72° C. for 60 sec; 72° C. 3 min.

[0369] Immobilization of DNA

[0370] The 50 μ l PCR reaction was added to 25 μ l of streptavidin coated magnetic bead (Dynal) prewashed three times and resuspended in 1M NH₄Cl, 0.06M NH₄OH. The PCR amplicons were allowed to bind to the beads for 15 minutes at room temperature. The beads were then collected with a magnet and the supernatant containing unbound DNA was removed. The unbound strand was released from the double stranded amplicons by incubation in 100 mM NaOH and washing of the beads three times with 10 mM Tris pH 8.0.

[0371] BiomassPROBE Assay Analysis of Donor Population for h-msr A

[0372] Genotyping using the BiomassPROBE assay methods was carried out by resuspending the DNA coated magnetic beads in 26 mM Tris-HCl pH 9.5, 6.5 mM MgCl₂, 50 mM of dTTPs and 50 mM each of ddCTP, ddATP, ddGTP, 2.5U of a thermostable DNA polymerase (Amber-sham), and 20 pmol of a template specific oligonucleotide PROBE primer 5'-CTGAAAAGGGAGAGAAAG-3' (Operon) (SEQ ID NO: 52). Primer extension occurs with three cycles of oligonucleotide primer with hybridization and extension. The extension products were analyzed after denaturation from the template with 50 mM NH₄Cl and transfer of 150 nl each sample to a silicon chip preloaded with 150 nl of H3PA matrix material. The sample material was allowed to crystallize and analyzed by MALDI-TOF (Bruker, PerSeptive). The SNP is represented as a T to C transversion in the sequence of two ESTs. The wild type is represented by having a T at position 128 of GenBank Accession No. AW 195104, which represents the nucleotide sequence of an EST which is a portion of the wild type human msrA gene (SEQ ID NO: 39). The SNP is presented as a C at position 129 of GenBank Accession No. AW 874187, which represents the nucleotide sequence of an EST which is a portion of an allele of the human msrA gene (SEQ ID NO: 40).

[0373] In a genomic sequence the SNP is represented as an A to G transversion. The primer utilized in the BioMass probe reaction had a mass of 5654.8 daltons. In the presence of the SNP the primer is extended by the incorporation of a ddC and has a mass of 5928. In the presence of the wildtype the primer is extended by adding a dT and a DDC to produce a mass of 6232.1 daltons.

[0374] The frequency of the SNP was measured in a population of age selected healthy individuals. Five hundred fifty-two (552) individuals between the ages of 18-39 years

(276 females, 276 males and 552 individuals between the age of 60-79 (184 females between the ages of 60-69, 368 males between the age of 60-79) were tested for the presence of the polymorphism localized in the nontranslated 3' region of h-msr-A.

[0375] Genotype difference between male age group among healthy individuals is significant. For the male population allele significance is $p=0.0009$ and genotype significance is $p=0.003$. The age-related allele and genotype frequency of this marker in both genders and the entire population is shown in FIG. 21. The decrease of the homozygous CC genotype in the older male population is highly significant.

[0376] The polymorphism is localized in the non-translated 3'-region of the gene encoding the human methionine sulfoxide reductase (h-msrA). The exact localization is 451 base pairs downstream the stop codon (TAA). It is likely that this SNP is in linkage disequilibrium (LD) with another polymorphism more upstream in the coding or promoter region; thus, it does not directly cause morbidity. The enzyme methionine sulfoxide reductase has been proposed to exhibit multiple biological functions. It can serve to repair oxidative protein damage but also play an important role in the regulation of proteins by activation or inactivation of their biological functions (Moskovitz et al. (1990) PNAS 95:14071-14075). It has also been shown that its activity is significantly reduced in brain tissues of Alzheimer patients (Gabbita et al., (1999) J. Neurochem 73:1660-1666). It is scientifically conceivable that proteins involved in the metabolism of reactive oxygen species are associated to disease.

[0377] Conclusion

[0378] The use of the healthy population provides for the identification of morbidity markers. The identification of proteins involved in the G-protein coupled signaling transduction pathway or in the detoxification of oxidative stress can be considered as convincing results. Further confirmation and validation of other potential polymorphisms already identified *in silico* in the gene encoding the human protein kinase A anchoring protein could even provide stronger association to morbidity and demonstrate that this gene product is a suitable pharmaceutical or diagnostic target.

EXAMPLE 4

[0379] MALDI-TOF Mass Spectrometry Analysis

[0380] All of the products of the enzyme assays listed below were analyzed by MALDI-TOF mass spectrometry. A diluted matrix solution (0.15 μ L) containing of 10:1 3-hydroxypicolinic acid:ammonium citrate in 1:1 water:acetonitrile diluted 2.5-fold with water was pipetted onto a SpectroChip (Sequenom, Inc.) and was allowed to crystallize. Then, 0.15 μ L of sample was added. A linear PerSeptive Voyager DE mass spectrometer or Bruker Biflex MALDI-TOF mass spectrometer, operating in positive ion mode, was used for the measurements. The sample plates were kept at 18.2 kV for 400 nm after each UV laser shot (approximate 250 laser shots total), and then the target voltage was raised to 20 kV. The original spectra were digitized at 500 MHz.

EXAMPLE 5

[0381] Sample Conditioning

[0382] Where indicated in the examples below, the products of the enzymatic digestions were purified with ZipTips (Millipore, Bedford, Mass.). The ZipTips were pre-wetted with 10 μ L 50% acetonitrile and equilibrated 4 times with 10 μ L 0.1 M TEAAc. The oligonucleotide fragments were bound to the C18 in the ZipTip material by continuous aspiration and dispensation of each sample into the ZipTip. Each digested oligonucleotide was conditioned by washing with 10 μ L 0.1 M TEAAc, followed by 4 washing steps with 10 μ L H₂O. DNA fragments were eluted from the ZipTip with 7 μ L 50% acetonitrile.

[0383] Any method for condition the samples can be employed. Methods for conditioning, which generally is used to increase peak resolution, are well known (see, e.g., International PCT application No. WO 98/20019).

EXAMPLE 6

[0384] DNA Glycosylase-Mediated Sequence Analysis

[0385] DNA Glycosylases modifies DNA at each position that a specific nucleobase resides in the DNA, thereby producing abasic sites. In a subsequent reaction with another enzyme, a chemical, or heat, the phosphate backbone at each abasic site can be cleaved.

[0386] The glycosylase utilized in the following procedures was uracil-DNA glycosylase (UDG). Uracil bases were incorporated into DNA fragments in each position that a thymine base would normally occupy by amplifying a DNA target sequence in the presence of uracil. Each uracil substituted DNA amplicon was incubated with UDG, which cleaved each uracil base in the amplicon, and was then subjected to conditions that effected backbone cleavage at each abasic site, which produced DNA fragments. DNA fragments were subjected to MALDI-TOF mass spectrometry analysis. Genetic variability in the target DNA was then assessed by analyzing mass spectra.

[0387] Glycosylases specific for nucleotide analogs or modified nucleotides, as described herein, can be substituted for UDG in the following procedures. The glycosylase methods described hereafter, in conjunction with phosphate backbone cleavage and MALDI, can be used to analyze DNA fragments for the purposes of SNP scanning, bacteria typing, methylation analysis, microsatellite analysis, genotyping, and nucleotide sequencing and re-sequencing.

[0388] A. Genotyping

[0389] A glycosylase procedure was used to genotype the DNA sequence encoding UCP-2 (Uncoupling Protein 2). The sequence for UCP-2 is deposited in GenBank under accession number AF096289. The sequence variation genotyped in the following procedure was a cytosine (C-allele) to thymine (T-allele) variation at nucleotide position 4790, which results in a alanine to valine mutation at position 55 in the UCP-2 polypeptide.

[0390] DNA was amplified using a PCR procedure with a 50 μ L reaction volume containing of 5 pmol biotinylated primer having the sequence 5'-TGCCTTATCCCTGTAGC-TACCCGTGCTTGGCCTTGCAGATCCAA-3' (SEQ ID NO: 91), 15 pmol non-biotinylated primer having the sequence 5'-AGCGGATAACAATTTCACACAGGCCAT-CACACCGCGGTACTG-3' (SEQ ID NO: 92), 200 μ M dATP, 200 μ M dCTP, 200 μ M dGTP, 600 μ M dUTP (to fully

replace dTTP), 1.5 mM to 3 mM $MgCl_2$, 1 U of HotStarTaq polymerase, and 25 ng of CEPH DNA. Amplification was effected with 45 cycles at an annealing temperature of 56° C.

[0391] The amplification product was then immobilized onto a solid support by incubating 50 μ L of the amplification reaction with 5 μ L of prewashed Dynabeads for 20 minutes at room temperature. The supernatant was removed, and the beads were incubated with 50 μ L of 0.1 M NaOH for 5 minutes at room temperature to denature the double-stranded PCR product in such a fashion that single-stranded DNA was linked to the beads. The beads were then neutralized by three washes with 50 μ L 10 mM TrisHCl (pH 8). The beads were resuspended in 10 μ L of a 60 mM TrisHCl/1 mM EDTA (pH 7.9) solution, and 1 U uracil DNA glycosylase was added to the solution for 45 minutes at 37° C. to remove uracil nucleotides present in the single-stranded DNA linked to the beads. The beads were then washed two times with 25 μ L of 10 mM TrisHCl (pH 8) and once with 10 μ L of water. The biotinylated strands were then eluted from the beads with 12 μ L of 2 M NH_4OH at 60° C. for 10 minutes. The backbone of the DNA was cleaved by incubating the samples for 10 min at 95° C. (with a closed lid), and ammonia was evaporated from the samples by incubating the samples for 11 min at 80° C.

[0392] The cleavage fragments were then analyzed by MALDI-TOF mass spectrometry as described in Example 4. The T-allele generated a unique fragment of 3254 Daltons. The C-allele generated a unique fragment of 4788 Daltons. These fragments were distinguishable in mass spectra. Thus, the above-identified procedure was successfully utilized to genotype individuals heterozygous for the C-allele and T-allele in UCP-2.

[0393] B. Glycosylase Analysis Utilizing Pooled DNA Samples

[0394] The glycosylase assay was conducted using pooled samples to detect genetic variability at the UCP-2 locus. DNA of known genotype was pooled from eleven individuals and was diluted to a fixed concentration of 5 ng/ μ L. The procedure provided in Example 3A was followed using 2 pmol of forward primer having a sequence of 5'-CCCAGT-CACGACGTTGTAAACGTCCTTG-3' and 15 pmol of reverse primer having the sequence 5'-AGCGGATAA-CAATTTCACACAGGCCATCACACCGCGGTACTG-3' (SEQ ID NO: 94). In addition, 5 pmol of biotinylated primer having the sequence 5'-bioCCCAAGTCACGACGTTGTAAACG 3' (SEQ ID NO: 97) can be introduced to the PCR reaction after about two cycles. The fragments were then analyzed via MALDI-TOF mass spectroscopy (Example 4). As determined in Example 3A, the T-allele, which generated a unique fragment of 3254 Daltons, could be distinguished in mass spectra from the C-allele, which generated a unique fragment of 4788 Daltons. Allelic frequency in the pooled samples was quantified by integrating the area under each signal corresponding to an allelic fragment. Integration was accomplished by hand calculations using equations well known to those skilled in the art. In the pool of eleven samples, this procedure suggested that 40.9% of the individuals harbored the T allele and 59.09% of the individuals harbored the C allele.

[0395] C. Glycosylase-Mediated Microsatellite Analysis

[0396] A glycosylase procedure was utilized to identify microsatellites of the Bradykinin Receptor 2 (BKR-2)

sequence. The sequence for BKR-2 is deposited in GenBank under accession number X86173. BKR-2 includes a SNP in the promoter region, which is a C to T variation, as well as a SNP in a repeated unit, which is a G to T variation. The procedure provided in Example 3A was utilized to identify the SNP in the promoter region, the SNP in the microsatellite repeat region, and the number of repeated units in the microsatellite region of BKR-2. Specifically, a forward PCR primer having the sequence 5'-CTCCAGCTGGGCAG-GAGTGC-3' (SEQ ID NO: 95) and a reverse primer having the sequence 5'-CACTTCAGTCGCTCCCT-3' (SEQ ID NO: 96) were utilized to amplify BKR-2 DNA in the presence of uracil. The amplicon was fragmented by UDG followed by backbone cleavage. The cleavage fragments were analyzed by MALDI-TOF mass spectrometry as described in Example 4.

[0397] With regard to the SNP in the BKR-2 promoter region having a C to T variation, the C-allele generated a unique fragment having a mass of 7342.4 Daltons, and the T-allele generated a unique fragment having a mass of 7053.2 Daltons. These fragments were distinguishable in mass spectra. Thus, the above-identified procedure was successfully utilized to genotype individuals heterozygous for the C-allele and T-allele in the promoter region of BKR-2.

[0398] With regard to the SNP in the BKR-2 repeat region having a G to T variation, the T-allele generated a unique fragment having a mass of 1784 Daltons, which was readily detected in a mass spectrum. Hence, the presence of the T-allele was indicative of the G to T sequence variation in the repeat region of BKR-2.

[0399] In addition, the number of repeat regions was distinguished between individuals having two repeat sequences and individuals having three repeat sequences in BKR-2. The DNA of these individuals did not harbor the G to T sequence variation in the repeat sequence as each repeat sequence contained a G at the SNP locus. The number of repeat regions was determined in individual samples by calculating the area under a signal corresponding to a unique DNA fragment having a mass of 2771.6 Daltons. This signal in spectra generated from individuals having two repeat regions had an area that was thirty-three percent less than the area under the same signal in spectra generated from individuals having three repeat regions. Thus, the procedures discussed above can be utilized to genotype individuals for the number of repeat sequences present in BKR-2.

[0400] D. Bisulfite Treatment Coupled with Glycosylase Digestion

[0401] Bisulfite treatment of genomic DNA can be utilized to analyze positions of methylated cytosine residues within the DNA. Treating nucleic acids with bisulfite deaminates cytosine residues to uracil residues, while methylated cytosine remains unmodified. Thus, by comparing the sequence of a PCR product generated from genomic DNA that is not treated with bisulfite with the sequence of a PCR product generated from genomic DNA that is treated with bisulfite, the degree of methylation in a nucleic acid as well as the positions where cytosine is methylated can be deduced.

[0402] Genomic DNA (2 μ g) was digested by incubation with 1 μ L of a restriction enzyme at 37° C. for 2 hours. An

aliquot of 3 M NaOH was added to yield a final concentration of 0.3M NaOH in the digestion solution. The reaction was incubated at 37° C. for 15 minutes followed by treatment with 5.35M urea, 4.44M bisulfite, and 10 mM hydroquinone, where the final concentration of hydroquinone is 0.5 mM.

[0403] The sample that was treated with bisulfite (sample A) was compared to the same digestion sample that had not undergone bisulfite treatment (sample B). After sample A was treated with bisulfite as described above, sample A and sample B were amplified by a standard PCR procedure. The PCR procedure included the step of overlaying each sample with mineral oil and then subjecting the sample to thermocycling (20 cycles of 15 minutes at 55° C. followed by 30 seconds at 95° C.). The PCR reaction contained four nucleotide bases, C, A, G, and U. The mineral oil was removed from each sample, and the PCR products were purified with glassmilk. Sodium iodide (3 volumes) and glassmilk (5 μ L) were added to samples A and B. The samples were then placed on ice for 8 minutes, washed with 420 μ L cold buffer, centrifuged for 10 seconds, and the supernatant fractions were removed. This process was repeated twice and then 25 μ L of water was added. Samples were incubated for 5 minutes at 37° C., were centrifuged for 20 seconds, and the supernatant fraction was collected, and then this incubation/centrifugation/supernatant fraction collection procedure was repeated. 50 μ L 0.1 M NaOH was then added to the samples to denature the DNA. The samples were incubated at room temperature for 5 minutes, washed three times with 50 μ L of 10 mM TrisHCl (pH 8), and resuspended in 10 μ L 60 mM TrisHCl/1 mM EDTA, pH 7.9.

[0404] The sequence of PCR products from sample A and sample B were then treated with 2U of UDG (MBI Fermentas) and then subjected to backbone cleavage, as described herein. The resulting fragments from each of sample A and sample B were analyzed by MALDI-TOF mass spectroscopy as described in Example 4. Sample A gave rise to a greater number of fragments than the number of fragments arising from sample B, indicative that the nucleic acid harbored at least one methylated cytosine moiety.

EXAMPLE 7

[0405] Fen-Ligase-Mediated Haplotyping

[0406] Haplotyping procedures permit the selection of a fragment from one of an individual's two homologous chromosomes and to genotype linked SNPs on that fragment. The direct resolution of haplotypes can yield increased information content, improving the diagnosis of any linked disease genes or identifying linkages associated with those diseases. In previous studies, haplotypes were typically reconstructed indirectly through pedigree analysis (in cases where pedigrees were available) through laborious and unreliable allele-specific PCR or through single-molecule dilution methods well known in the art.

[0407] A haplotyping procedure was used to determine the presence of two SNPs, referred to as SNP1 and SNP2, located on one strand in a DNA sample. The haplotyping procedure used in this assay utilized Fen-1, a site-specific "flap" endonuclease that cleaves DNA "flaps" created by the overlap of two oligonucleotides hybridized to a target DNA strand. The two overlapping oligonucleotides in this example were short arm and long arm allele-specific adap-

tors. The target DNA was an amplified nucleic acid that had been denatured and contained SNP1 and SNP2.

[0408] The short arm adaptor included a unique sequence not found in the target DNA. The 3' distal nucleotide of the short arm adaptor was identical to one of the SNP1 alleles. Moreover, the long arm adaptor included two regions: a 3' region complementary to the short arm and a 5' gene-specific region complementary to the fragment of interest adjacent to the SNP. If there was a match between the adaptor and one of the homologues, the Fen enzyme recognized and cleaved the overlapping flap. The short arm of the adaptor was then ligated to the remainder of the target fragment (minus the SNP site). This ligated fragment was used as the forward primer for a second PCR reaction in which only the ligated homologue was amplified. The second PCR product (PCR2) was then analyzed by mass spectrometry. If there was no match between the adaptors and the target DNA, there was no overlap, no cleavage by Fen-1, and thus no PCR2 product of interest.

[0409] If there was more than one SNP in the sequence of interest, the second SNP (SNP2) was found by using an adaptor that was specific for SNP2 and hybridizing the adaptor to the PCR2 product containing the first SNP. The Fen-ligase and amplification procedures were repeated for the PCR2 product containing the first SNP. If the amplified product yielded a second SNP, then SNP1 and SNP2 were on the same fragment.

[0410] If the SNP is unknown, then four allele-specific adaptors (e.g. C, G, A, and T) can be used to hybridize with the target DNA. The substrates are then treated with the Fen-ligase protocol, including amplification. The PCR2 products can be analyzed by PROBE, as described herein, to determine which adaptors were hybridized to the DNA target and thus identify the SNPs in the sequence.

[0411] A Fen-ligase assay was used to detect two SNPs present in Factor VII. These SNPs are located 814 base pairs apart from each other. SNP1 was located at position 8401 (C to T), and SNP2 was located at 9215 (G to A).

[0412] A. First Amplification Step

[0413] A PCR product (PCR1) was generated for a known heterozygous individual at SNP1, a short distance from the 5' end of the SNP. Specifically, a 10 μ L PCR reaction was performed by mixing 1.5 mM MgCl₂, 200 μ M of each dNTP, 0.5 U HotStar polymerase, 0.1 μ M of a forward primer having the sequence 5'-GCG CTC CTG TCG GTG CCA (SEQ ID NO: 56), 0.1 μ M of a reverse primer having the sequence 5'-GCC TGA CTG GTG GGG CCC (SEQ ID NO: 57), and 1 ng of genomic DNA. The annealing temperature was 58° C., and the amplification process yielded fragments that were 861 bp in length.

[0414] The PCR1 reaction mixture was divided in half and was treated with an exonuclease 1/SAP mixture (0.22 μ L mixture/5 μ L PCR1 reaction) which contained 1.0 μ L SAP and 0.1 μ L exon1. The exonuclease treatment was done for 30 minutes at 37° C. and then 20 minutes at 85° C. to denature the DNA.

[0415] B. Adaptor Oligonucleotides

[0416] A solution of allele-specific adaptors (C and T), containing of one long and one short oligonucleotide per adaptor, was prepared. The long arm and short arm oligo-

nucleotides of each adaptor (10 μ M) were mixed in a 1:1 ratio and heated for 30 seconds at 95° C. The temperature was reduced in 2° C. increments to 37° C. for annealing. The C-adaptor had a short arm sequence of 5'-CAT GCA TGC ACG GTC (SEQ ID NO: 58) and a long arm sequence of 5'-CAG AGA GTA CCC CTC GAC CGT GCA TGC ATG (SEQ ID NO: 59). Hence, the long arm of the adaptor was 30 bp (15 bp gene-specific), and the short arm was 15 bp. The T-adaptor had a short arm sequence of 5'-CAT GCA TGC ACG GTT (SEQ ID NO: 60) and a long arm sequence of 5'-GTA CGT ACG TGC CAA CTC CCC ATG AGA GAC (SEQ ID NO: 61). The adaptor could also have a hairpin structure in which the short and long arm are separated by a loop containing of 3 to 10 nucleotides (SEQ ID NO: 118).

[0417] C. FEN-ligase Reaction

[0418] In two tubes (one tube for each allele-specific adaptor per sample) was placed a solution (Solution A) containing of 3.5 μ l 10 mM 16% PEG/50 mM MOPS, 1.2 μ l 25 mM $MgCl_2$, 1.5 μ l 10X Ampligase Buffer, and 2.5 μ l PCR1. Each tube containing Solution A was incubated at 95° C. for 5 minutes to denature the PCR1 product. A second solution (Solution B) containing of 1.65 μ l Ampligase (ThermoFisher Scientific, Epicentre Technologies), 1.65 μ l 200 ng/ μ l MFEN (from *Methanococcus jannaschii*), and 3.0 μ l of an allele specific adaptor (C or T) was prepared. Thus, different variations of Solution B, each variation containing of different allele-specific adaptors, were made. Solution B was added to Solution A at 95° C. and incubated at 55° C. for 3 hours. The total reaction volume was 15.0 μ l per adaptor-specific reaction. For a bi-allelic system, 2x15.0 μ l reactions were required.

[0419] The Fen-ligase reaction in each tube was then deactivated by adding 8.0 μ l 10 mM EDTA. Then, 1.0 μ l exoIII/Buffer (70%/30%) solution was added to each sample and incubated 30 minutes at 37° C., 20 minutes at 70° C. (to deactivate exoIII), and 5 minutes at 95° C. (to denature the sample and dissociate unused adaptor from template). The samples were cooled in an ice slurry and purified on Ultra-Clean PCR Clean-up (MoBio) spin columns which removed all fragments less than 100 base pairs in length. The fragments were eluted with 50 μ l H_2O .

[0420] D. Second Amplification Step

[0421] A second amplification reaction (PCR2) was conducted in each sample tube using the short arm adaptor (C or T) sequence as the forward primer (minus the SNP1 site). Only the ligated homologue was amplified. A standard PCR reaction was conducted with a total volume of 10.0 μ l containing of 1xBuffer (final concentration), 1.5 mM final concentration $MgCl_2$, 200 μ M final concentration dNTPs, 0.5 U HotStar polymerase, 0.1 μ M final concentration forward primer 5'-CAT GCA TGC ACG GT (SEQ ID NO: 62), 0.1 μ M final concentration reverse primer 5'-GCC TGA CTG GTG GGG CCC (SEQ ID NO: 63), and 1.0 μ l of the purified FEN-ligase reaction solution. The annealing temperature was 58° C. The PCR2 product was analyzed by MALDI TOF mass spectroscopy as described in Example 4. The mass spectrum of Fen SNP1 showed a mass of 6084.08 Daltons, representing the C allele.

[0422] E. Genotyping Additional SNPs

[0423] The second SNP (SNP2) can be found by using an adaptor that is specific for SNP2 and hybridizing that

adaptor to the PCR2 product containing the first SNP. The Fen-ligase and amplification procedures are repeated for the PCR2 product containing the first SNP. If the amplified product yields a second SNP, then SN1 and SN2 are on the same fragment. The mass spectrum of SNP2, representing the T allele, showed a mass of 6359.88 Daltons.

[0424] This assay also can be performed upon pooled DNA to yield haplotype frequencies as described herein. The Fen-ligase assay can be used to analyze multiplexes as described herein.

EXAMPLE 8

[0425] Nickase-Mediated Sequence Analysis

[0426] A DNA nickase, or DNase, was used to recognize and cleave one strand of a DNA duplex. NY2A nickase and NYS1 nickase (Megabase), which cleave DNA at the following sites:

[0427] NY2A: 5' . . . R AG . . . 3'

[0428] 340 . . . YITC . . . 5' where R=A or G and Y=C or T

[0429] NYS1: 5' . . . ICC[A/G/T] . . . 3'

[0430] 3' . . . GG[T/C/A] . . . 5'

[0431] were used.

[0432] A. Nickase Digestion

[0433] Tris-HCl (10 mM), KCl (10 mM, pH 8.3), magnesium acetate (25 mM), BSA (1 mg/mL), and 6 U of Cvi NY2A or Cvi NYS1 Nickase (Megabase Research) were added to 25 pmol of double-stranded oligonucleotide template having a sequence of 5'-CGC AGG GTT TCC TCG TCG CAC TGG GCA TGT G-3' (SEQ ID NO: 90, Operon, Alameda, Calif.) synthesized using standard phosphoramidite chemistry. With a total volume of 20 μ l, the reaction mixture was incubated at 37° C. for 5 hours, and the digestion products were purified using ZipTips (Millipore, Bedford, Mass.) as described in Example 5. The samples were analyzed by MALDI-TOF mass spectroscopy as described in Example 1. The nickase Cvi NY2A yielded three fragments with masses 4049.76 Daltons, 5473.14 Daltons, and 9540.71 Daltons. The Cvi NYS1 nickase yielded fragments with masses 2063.18 Daltons, 3056.48 Daltons, 6492.81 Daltons, and 7450.14 Daltons.

[0434] B. Nickase Digestion of Pooled Samples

[0435] DQA (HLA ClassII-DQ Alpha, expected fragment size=225 bp) was amplified from the genomic DNA of 100 healthy individuals. DQA was amplified using standard PCR chemistry in a reaction having a total volume of 50 μ l containing of 10 mM Tris-HCl, 10 mM KCl (pH 8.3), 2.5 mM $MgCl_2$, 200 μ M of each dNTP, 10 pmol of a forward primer having the sequence 5'-GTG CTG CAG GTG TAA ACT TGT ACC AG-3' (SEQ ID NO: 64), 10 pmol of a reverse primer having the sequence 5'-CAC GGA TCC GGT AGC AGC GGT AGA GTT G-3' (SEQ ID NO: 65), 1 U DNA polymerase (Stoffel fragment, Perkin Elmer), and 200 ng human genomic DNA (2 ng DNA/individual). The template was denatured at 94° C. for 5 minutes. Thermal cycling was continued with a touch-down program that included 45 cycles of 20 seconds at 94° C., 30 seconds at 56° C., 1

minute at 72° C., and a final extension of 3 minutes at 72° C. The crude PCR product was used in the subsequent nickase reaction.

[0436] The unpurified PCR product was subjected to nickase digestion. Tris-HCl (10 mM), KCl (10 mM, pH 8.3), magnesium acetate (25 mM), BSA (1 mg/mL), and 5 U of Cvi NY2A or Cvi NYS1 Nickase (Megabase Research) were added to 25 pmol of the amplified template with a total reaction volume of 20 μ L. The mixture was then incubated at 37° C. for 5 hours. The digestion products were purified with either ZipTips (Millipore, Bedford, Mass.) as described in Example 5. The samples were analyzed by MALDI-TOF mass spectroscopy as described in Example 4. This assay also can be used to do multiplexing and standardless genotyping as described herein.

[0437] To simplify the nickase mass spectrum, the two complementary strands can be separated after digestion by using a single-stranded undigested PCR product as a capture probe. This probe (preparation shown below in Example 8C) can be hybridized to the nickase fragments in hybridization buffer containing 200 mM sodium citrate and 1% blocking reagent (Boehringer Mannheim). The reaction is heated to 95° C. for 5 minutes and cooled to room temperature over 30 minutes by using a thermal cycler (PTC-200 DNA engine, MJ Research, Waltham, Mass.). The capture probe-nickase fragment is immobilized on 140 μ g of streptavidin-coated magnetic beads. The beads are subsequently washed three times with 70 mM ammonium citrate. The captured single-stranded nickase fragments are eluted by heating to 80° C. for 5 minutes in 5 μ L of 50 mM ammonium hydroxide.

[0438] C. Preparation of Capture Probe

[0439] The capture probe is prepared by amplifying the human β -globin gene (3' end of intron 1 to 5' end of exon 2) via PCR methods in a total volume of 50 μ L containing of GeneAmp 1XPCR Buffer II, 10 mM Tris-HCl, pH 8.3, 50 mM KCl, 2 mM MgCl₂, 0.2 mM dNTP mix, 10 pmol of each primer (forward primer 5'-ACTGGGCATGTGGAGACAG-3'(SEQ ID NO: 66) and biotinylated reverse primer bio5'-GCACCTTCTTGGCCATGAG-3'(SEQ ID: 67), 2 U of AmpliTaq Gold, and 200 ng of human genomic DNA. The template is denatured at 94° C. for 8 minutes. Thermal cycling is continued with a touch-down program that included 11 cycles of 20 seconds at 94° C., 30 seconds at 64° C., 1 minute at 72° C.; and a final extension of 5 minutes at 72° C. The amplicon is purified using UltraClean™ PCR clean-up kit (MO Bio Laboratories, Solano Beach, Calif.).

EXAMPLE 9

[0440] Multiplex Type IIS SNP Assay

[0441] A Type IIS assay was used to identify human gene sequences with known SNPs. The Type IIS enzyme used in

this assay was Fok I which effected double-stranded cleavage of the target DNA. The assay involved the steps of amplification and Fok I treatment of the amplicon. In the amplification step, the primers were designed so that each PCR product of a designated gene target was less than 100 bases such that a Fok I recognition sequence was incorporated at the 5' and 3' end of the amplicon. Therefore, the fragments that were cleaved by Fok I included a center fragment containing the SNP of interest.

[0442] Ten human gene targets with known SNPs were analyzed by this assay. Sequences of the ten gene targets, as well as the primers used to amplify the target regions, are found in Table 5. The ten targets were lipoprotein lipase, prothrombin, factor V, cholesterol ester transfer protein (CETP), factor VII, factor XIII, HLA-H exon 2, HLA-H exon 4, methylenetetrahydrofolate reductase (MTHR), and P53 exon 4 codon 72.

[0443] Amplification of the ten human gene sequences were carried out in a single 50 μ L volume PCR reaction with 20 ng of human genomic DNA template in 5 PCR reaction tubes. Each reaction vial contained 1xPCR buffer (Qiagen), 200 μ M dNTPs, 1 U Hotstar Taq polymerase (Qiagen), 4 mM MgCl₂, and 10 pmol of each primer. US8, having sequence of 5'TCAGTTCACGACGTT3'(SEQ ID NO: 68), and US9, having sequence of 5'CGGATAACAATTTC3'(SEQ ID NO: 69), were used for the forward and reverse primers respectively. Moreover, the primers were designed such that a Fok I recognition site was incorporated at the 5' and 3' ends of the amplicon. Thermal cycling was performed in 0.2 mL tubes or a 96 well plate using a MJ Research Thermal Cycler (calculated temperature) with the following cycling parameters: 94° C. for 5 minutes; 45 cycles: 94° C. for 20 seconds, 56° C. for 20 seconds, 72° C. for 60 seconds; and 72° C. for 3 minutes.

[0444] Following PCR, the sample was treated with 0.2 U Exonuclease I (Amersham Pharmacia) and S Alkaline Phosphatase (Amersham Pharmacia) to remove the unincorporated primers and dNTPs. Typically, 0.2 U of exonuclease I and SAP were added to 5 μ L of the PCR sample. The sample was then incubated at 37° C. for 15 minutes. Exonuclease I and SAP were then inactivated by heating the sample up to 85° C. for 15 minutes. Fok I digestion was performed by adding 2 U of Fok I (New England Biolab) to the 5 μ L PCR sample and incubating at 37° C. for 30 minutes. Since the Fok I restriction sites are located on both sides of the amplicon, the 5' and 3' cutoff fragments have higher masses than the center fragment containing the SNP. The sample was then purified by anion exchange and analyzed by MALDI-TOF mass spectrometry as described in Example 4. The masses of the gene fragments from this multiplexing experiment are listed in Table 6. These gene fragments were resolved in mass spectra thereby allowing multiplex analysis of sequence variability in these genes.

TABLE 5

Genes for Multiplex Type IIS Assay				
Gene	Sequence	Seq. ID No	Primers	Seq. ID No.
Lipoprotein Lipase (Asn291Ser)	cotttgagaa agggctctgc ttgattgta gnaagancgc ctgcacnact <u>ctggcctatg atgata[n]a g]a aagtcagagcc</u> <u>aaaagangca gcaaatgta</u>	98-99	5' caatttcacacagggatgcaatct ggcctatgagatc 3'	70
			5' caatttcacacagggatgcttct tttgctctgact 3'	71
Prothrombin	26731 gaattatgt ttgttttcta aaactatgt tcccaataaa agtgcactctc 26781 <u>agc[n]a]agctctc atgtctccca</u> <u>gtctattca tgggcagctc tctgggctca</u>	100-101	5' tcagtcacgacgttggatgcaca taaatgttactctcagc 3'	72
			5' cgataacaatttcggatgcact ggagacatgagcc 3'	73
Factor V (Arg506Gln)	tastaggaact acttctaate tgltaagaca <u>gatccctgga cagg[n]a]agga</u>	102-103	5' tcagtcacgacgttggatgcaca gatccctggagagcc 3'	74
	<u>atacaggatattttgctctg angtaacct tca</u>		5' cgataacaatttcggatgcaca aaataacctgtatccc 3'	75
Cholesterol ester transfer protein (CETP) (I405V)	1261 ctacacatgg gcaattgat <u>gcagagagcc</u> <u>tccggtctcc gaa]tccagagctt</u>	104-105	5' tcagtcacgacgttggatgcaca gcagctccagctc 3'	76
	1311 <u>ctctgagaca atgcacacgc ctg]ggagcat</u> <u>ccttgaggctc atgtctgta</u>		5' cagcgtgatcatctggatgcagg aagctctga 3'	77
Factor VII (R353Q)	1271 agcagagact cctgcagagg ggcagatggg <u>ggcagacatg ccaaccacata</u>	106-107	5' tcagtcacgacgttggatgcaca catgcacacacacac 3'	78
	1271 <u>ca[n]a]gggcacg ttgtaactga</u> <u>cgggacatgt cagctggggc cagggcctgc</u>		5' cgataacaatttcggatgcagg tcaagctctcc 3'	79
Factor XIII (V34L)	111 caataactct aatgcagcgg aagatgacct <u>gcccacatg gaggctcagg</u>	108-109	5' tcagtcacgacgttggatgcaca catgtgagctctcag 3'	80
	161 <u>gct[n]t]gggtgcc ccaggagcgc</u> <u>aacctgagag atagagacat aaccaccttc</u>		5' gcataaccttgcagatgacg 3'	81
HLA-H exon 2 (His63Asp)	361 tgaagctttgggtacgtg gatgaccagc <u>tgctgtgtt ctatgat[n]a]at</u>	110-111	5' tcagtcacgacgttggatgcaca gctgttctgttgc 3'	82
	411 <u>gagagatgcc gttggagccc ccgaactcca</u> <u>tgggtttca gtagaatttc</u>		5' tcactgaggttcggagatgcaca caggagactctc 3'	83
HLA-H exon 4 (Cys282Tyr)	1021 ggtatancctt ggctgtaccc cctggggagag <u>agcagagata tacc[n]a]aang</u>	112-113	5' tcagtcacgacgttggatgcaca agagcagagatatacgt 3'	84
	1071 <u>gtgagacacc caggcctgga tcagccctcc</u> <u>atgtgtactt gggagccctc</u>		5' gaggggctctatcagagatgggt gtctcac 3'	85
Methylentetrahydrofolate-reductase (MTHR) (Ala222Val)	761 <u>tgaagacatt gaagga gaag gtgtctgcgg</u> <u>gag[n]t]aattt catcatcagc</u>	114-115	5' tcagtcacgacgttggatgcaca agagcagagatatacgt 3'	86
	811 <u>cagctttctt ttgaggtga caactcttc</u>		5' gaggggctctatcagagatgggt gtctcac 3'	87
P53 Exon4 Codon 72 (Arg72Pro)	12101 tccagatgaa gctcccagaa <u>tgcacagggc tgcctccc[n]t]t gtggccctcg</u>	116-117	5' gatgagctcccagatgcagg aggc 3'	88
	12151 <u>caccagmcgctcctacnccg</u> <u>ggggccctcg</u>		5' gccgccgggtgtaggatgtctctg atgc 3'	89

[0445]

TABLE 6

The mass of Center Fragments for Ten Different SNP Typing by IIS Assay												
Gene	LPL(^{Asn291Ser})		Prothrombin		FV(^{Arg506Gln})		CETP(^{Leu405Val})		FVII(^{Arg353Gln})		FXIII(^{Val34})	
Genotype	A	G	G	A	G	A	G	A	G	A	G	T
+ strand mass (Da)	6213	6229	5845	5829	5677	5661	3388	3372	6128	6112	5058	5033
- strand mass (Da)	6129	6114	5949	5964	5472	5487	3437	3452	6174	6189	4916	4940

Gene	H1ah2		H1ah4		MTHR(^{Ala222Val})		P53exon4(^{Asp72Pro})	
Genotype	C	G	G	A	C	T	G	C
+ strand mass (Da)	5889	5929	4392	4376	4400	4415	4586	4546
- strand mass (Da)	5836	5796	4319	4334	4368	4352	4724	4764

EXAMPLE 10

[0446] Exemplary use of Parental Medical History Parameter for Stratification of Healthy Database

[0447] A healthy database can be used to associate a disease state with a specific allele (SNP) that has been found to show a strong association between age and the allele, in particular the homozygous genotype. The method involves using the same healthy database used to identify the age dependent association, however stratification is by information given by the donors about common disorders from which their parents suffered (the donor's familial history of disease). There are three possible answers a donor could give about the health status of their parents: neither were affected, one was affected or both were affected. Only donors above a certain minimum age, depending on the disease, are utilized, as the donors parents must be old enough to to have exhibited clinical disease phenotypes. The genotype frequency in each of these groups is determined and compared with each other. If there is an association of the marker in the donor to a disease the frequency of the heterozygous genotype will be increased. The frequency of the homozygous genotype should not increase, as it should be significantly underrepresented in the healthy population.

EXAMPLE 11

[0448] Method and Device for Identifying a Biological Sample Description

[0449] A method and device for identifying a biological sample is provided. Referring now to FIG. 24, an apparatus 10 for identifying a biological sample is disclosed. The apparatus 10 for identifying a biological sample generally comprises a mass spectrometer 15 communicating with a computing device 20. In an embodiment, the mass spectrometer can be a MALDI-TOF mass spectrometer manufactured by Bruker-Franzen Analytik GmbH; however, it will be appreciated that other mass spectrometers can be substituted. The computing device 20 is typically a general

purpose computing device. It will be appreciated that the computing device could be alternatively configured, for example, it can be integrated with the mass spectrometer or could be part of a computer in a larger network system.

[0450] The apparatus 10 for identifying a biological sample can operate as an automated identification system having a robot 25 with a robotic arm 27 configured to deliver a sample plate 29 into a receiving area 31 of the mass spectrometer 15. In such a manner, the sample to be identified can be placed on the plate 29 and automatically received into the mass spectrometer 15. The biological sample is then processed in the mass spectrometer to generate data indicative of the mass of DNA fragments in the biological sample. This data can be sent directly to computing device 20, or can have some preprocessing or filtering performed within the mass spectrometer. In an embodiment, the mass spectrometer 15 transmits unprocessed and unfiltered mass spectrometry data to the computing device 20. It will be appreciated that the analysis in the computing device can be adjusted to accommodate preprocessing or filtering performed within the mass spectrometer.

[0451] Referring now to FIG. 25, a general method 35 for identifying a biological sample is shown. In method 35, data are received into a computing device from a test instrument in block 40. Generally the data are received in a raw, unprocessed and unfiltered form, but alternatively can have some form of filtering or processing applied. The test instrument of an exemplary embodiment is a mass spectrometer as described above. It will be appreciated that other test instruments could be substituted for the mass spectrometer.

[0452] The data generated by the test instrument, and in particular the mass spectrometer, includes information indicative of the identification of the biological sample. More specifically, the data are indicative of the DNA composition of the biological sample. Typically, mass spectrometry data gathered from DNA samples obtained from DNA amplification techniques are noisier than, for example, those

from typical protein samples. This is due in part because protein samples are more readily prepared in more abundance, and protein samples are more easily ionizable as compared to DNA samples. Accordingly, conventional mass spectrometer data analysis techniques are generally ineffective for DNA analysis of a biological sample. To improve the analysis capability so that DNA composition data can be more readily discerned, an embodiment uses wavelet technology for analyzing the DNA mass spectrometry data. Wavelets are an analytical tool for signal processing, numerical analysis, and mathematical modeling. Wavelet technology provides a basic expansion function which is applied to a data set. Using wavelet decomposition, the data set can be simultaneously analyzed in the time and frequency domains. Wavelet transformation is the technique of choice in the analysis of data that exhibit complicated time (mass) and frequency domain information, such as MALDI-TOF DNA data. Wavelet transforms as described herein have superior denoising properties as compared to conventional Fourier analysis techniques. Wavelet transformation has proven to be particularly effective in interpreting the inherently noisy MALDI-TOF spectra of DNA samples. In using wavelets, a "small wave" or "scaling function" is used to transform a data set into stages, with each stage representing a frequency component in the data set. Using wavelet transformation, mass spectrometry data can be processed, filtered, and analyzed with sufficient discrimination to be useful for identification of the DNA composition for a biological sample.

[0453] Referring again to FIG. 25, the data received in block 40 is denoised in block 45. The denoised data then has a baseline correction applied in block 50. A baseline correction is generally necessary as data coming from the test instrument, in particular a mass spectrometer instrument, has data arranged in a generally exponentially decaying manner. This generally exponential decaying arrangement is not due to the composition of the biological sample, but is a result of the physical properties and characteristics of the test instrument, and other chemicals involved in DNA sample preparation. Accordingly, baseline correction substantially corrects the data to remove a component of the data attributable to the test system, and sample preparation characteristics.

[0454] After denoising in block 45 and the baseline correction in block 50, a signal remains which is generally indicative of the composition of the biological sample. Due to the extraordinary discrimination required for analyzing the DNA composition of the biological sample, the composition is not readily apparent from the denoised and corrected signal. For example, although the signal can include peak areas, it is not yet clear whether these "putative" peaks actually represent a DNA composition, or whether the putative peaks are the result of a systemic or chemical aberration. Further, any call of the composition of the biological sample would have a probability of error which would be unacceptable for clinical or therapeutic purposes. In such critical situations, there needs to be a high degree of certainty that any call or identification of the sample is accurate. Therefore, additional data processing and interpretation is necessary before the sample can be accurately and confidently identified.

[0455] Since the quantity of data resulting from each mass spectrometry test is typically thousands of data points, and

an automated system can be set to perform hundreds or even thousands of tests per hour, the quantity of mass spectrometry data generated is enormous. To facilitate efficient transmission and storage of the mass spectrometry data, block 55 shows that the denoised and baseline corrected data are compressed.

[0456] In one embodiment, the biological sample is selected and processed to have only a limited range of possible compositions. Accordingly, it is therefore known where peaks indicating composition should be located, if present. Taking advantage of knowing the location of these expected peaks, in block 60 the method 35 matches putative peaks in the processed signal to the location of the expected peaks. In such a manner, the probability of each putative peak in the data being an actual peak indicative of the composition of the biological sample can be determined. Once the probability of each peak is determined in block 60, then in block 65 the method 35 statistically determines the composition of the biological sample, and determines if confidence is high enough to calling a genotype.

[0457] Referring again to block 40, data are received from the test instrument, which can be a mass spectrometer. In a specific illustration, FIG. 26 shows an example of data from a mass spectrometer. The mass spectrometer data 70 generally comprises data points distributed along an x-axis 71 and a y-axis 72. The x-axis 71 represents the mass of particles detected, while the y-axis 72 represents a numerical concentration of the particles. As can be seen in FIG. 26, the mass spectrometry data 70 is generally exponentially decaying with data at the left end of the x-axis 73 generally decaying in an exponential manner toward data at the heavier end 74 of the x-axis 71. The general exponential presentation of the data is not indicative of the composition of the biological sample, but is more reflective of systematic error and characteristics. Further, as described above and illustrated in FIG. 26, considerable noise exists in the mass spectrometry DNA data 70.

[0458] Referring again to block 45, where the raw data received in block 40 is denoised, the denoising process will be described in more detail. As illustrated in FIG. 25, the denoising process generally entails 1) performing a wavelet transformation on the raw data to decompose the raw data into wavelet stage coefficients; 2) generating a noise profile from the highest stage of wavelet coefficients; and 3) applying a scaled noise profile to other stages in the wavelet transformation. Each step of the denoising process is further described below.

[0459] Referring now to FIG. 27, the wavelet transformation of the raw mass spectrometry data is generally diagrammed. Using wavelet transformation techniques, the mass spectrometry data 70 is sequentially transformed into stages. In each stage, the data are represented in a high stage and a low stage, with the low stage acting as the input to the next sequential stage. For example, the mass spectrometry data 70 is transformed into stage 0 high data 82 and stage 0 low data 83. The stage 0 low data 83 is then used as an input to the next level transformation to generate stage 1 high data 84 and stage 1 low data 85. In a similar manner, the stage 1 low data 85 is used as an input to be transformed into stage 2 high data 86 and stage 2 low data 87. The transformation is continued until no more useful information can be derived by further wavelet transformation. For example, in the one

embodiment a 24-point wavelet is used. More particularly a wavelet commonly referred to as the Daubechies 24 is used to decompose the raw data. It will be appreciated that other wavelets can be used for the wavelet transformation. Since each stage in a wavelet transformation has one-half the data points of the previous stage, the wavelet transformation can be continued until the stage n low data 89 has around 50 points. Accordingly, the stage n high 88 would contain about 100 data points. Since the exemplary wavelet is 24 points long, little data or information can be derived by continuing the wavelet transformation on a data set of around 50 points.

[0460] FIG. 28 shows an example of stage 0 high data 95. Since stage 0 high data 95 is generally indicative of the highest frequencies in the mass spectrometry data, stage 0 high data 95 will closely relate to the quantity of high frequency noise in the mass spectrometry data. In FIG. 29, an exponential fitting formula has been applied to the stage 0 high data 95 to generate a stage 0 noise profile 97. In particular, the exponential fitting formula is in the format $A_1 + A_2 \cdot \text{EXP}(-A_3 \cdot m)$. It will be appreciated that other exponential fitting formulae or other types of curve fits can be used.

[0461] Referring now to FIG. 30, noise profiles for the other high stages are determined. Since the later data points in each stage will likely be representative of the level of noise in each stage, only the later data points in each stage are used to generate a standard deviation figure that is representative of the noise content in that particular stage. More particularly, in generating the noise profile for each remaining stage, only the last five percent of the data points in each stage are analyzed to determine a standard deviation number. It will be appreciated that other numbers of points, or alternative methods could be used to generate such a standard deviation figure.

[0462] The standard deviation number for each stage is used with the stage 0 noise profile (the exponential curve) 97 to generate a scaled noise profile for each stage. For example, FIG. 30 shows that stage 1 high data 98 has stage 1 high data 103 with the last five percent of the data points represented by area 99. The points in area 99 are evaluated to determine a standard deviation number indicative of the noise content in stage 1 high data 103. The standard deviation number is then used with the stage 0 noise profile 97 to generate a stage 1 noise profile.

[0463] In a similar manner, stage 2 high 100 has stage 2 high data 104 with the last five percent of points represented by area 101. The data points in area 101 are then used to calculate a standard deviation number which is then used to scale the stage 0 noise profile 97 to generate a noise profile for stage 2 data. This same process is continued for each of the stage high data as shown by the stage n high 105. For stage n high 105, stage n high data 108 has the last five percent of data points indicated in area 106. The data points in area 106 are used to determine a standard deviation number for stage n. The stage n standard deviation number is then used with the stage 0 noise profile 97 to generate a noise profile for stage n. Accordingly, each of the high data stages has a noise profile.

[0464] FIG. 31 shows how the noise profile is applied to the data in each stage. Generally, the noise profile is used to generate a threshold which is applied to the data in each stage. Since the noise profile is already scaled to adjust for

the noise content of each stage, calculating a threshold permits further adjustment to tune the quantity of noise removed. Wavelet coefficients below the threshold are ignored while those above the threshold are retained. Accordingly, the remaining data have a substantial portion of the noise content removed.

[0465] Due to the characteristics of wavelet transformation, the lower stages, such as stage 0 and 1, will have more noise content than the later stages such as stage 2 or stage n. Indeed, stage n low data are likely to have little noise at all. Therefore, in an embodiment, the noise profiles are applied more aggressively in the lower stages and less aggressively in the later stages. For example, FIG. 31 shows that stage 0 high threshold is determined by multiplying the stage 0 noise profile by a factor of four. In such a manner, significant numbers of data points in stage 0 high data 95 will be below the threshold and therefore eliminated. Stage 1 high threshold 112 is set at two times the noise profile for the stage 1 high data, and stage 2 high threshold 114 is set equal to the noise profile for stage 2 high. Following this geometric progression, stage n high threshold 116 is therefore determined by scaling the noise profile for each respective stage n high by a factor equal to $(\frac{1}{2})^{n-2}$. It will be appreciated that other factors can be applied to scale the noise profile for each stage. For example, the noise profile can be scaled more or less aggressively to accommodate specific systemic characteristics or sample compositions. As indicated above, stage n low data does not have a noise profile applied as stage n low data 118 is assumed to have little or no noise content. After the scaled noise profiles have been applied to each high data stage, the mass spectrometry data 70 has been denoised and is ready for further processing. A wavelet transformation of the denoised signal results in the sparse data set 120 as shown in FIG. 31.

[0466] Referring again to FIG. 25, the mass spectrometry data received in block 40 has been denoised in block 45 and is now passed to block 50 for baseline correction. Before performing baseline correction, the artifacts introduced by the wavelet transformation procedure can be removed. Wavelet transformation results vary slightly depending upon which point of the wavelet is used as a starting point. For example, an exemplary embodiment uses the 24-point Daubechies-24 wavelet. By starting the transformation at the 0 point of the wavelet, a slightly different result will be obtained than if starting at points 1 or 2 of the wavelet. Therefore, the denoised data are transformed using every available possible starting point, with the results averaged to determine a final denoised and shifted signal. For example, FIG. 33 shows that the wavelet coefficient is applied 24 different times and then the results averaged to generate the final data set. It will be appreciated that other techniques can be used to accommodate the slight error introduced due to wavelet shifting.

[0467] The formula 125 is generally indicated in FIG. 33. Once the signal has been denoised and shifted, a denoised and shifted signal 130 is generated as shown in FIG. 58. FIG. 34 shows an example of the wavelet coefficient 135 data set from the denoised and shifted signal 130.

[0468] FIG. 36 shows that putative peak areas 145, 147, and 149 are located in the denoised and shifted signal 150. The putative peak areas are systematically identified by taking a moving average along the signal 150 and identify-

ing sections of the signal 150 which exceed a threshold related to the moving average. It will be appreciated that other methods can be used to identify putative peak areas in the signal 150.

[0469] Putative peak areas 145, 147 and 149 are removed from the signal 150 to create a peak-free signal 155 as shown in FIG. 37. The peak-free signal 155 is further analyzed to identify remaining minimum values 157, and the remaining minimum values 157 are connected to generate the peak-free signal 155.

[0470] FIG. 38 shows a process of using the peak-free signal 155 to generate a baseline 170 as shown in FIG. 39. As shown in block 162, a wavelet transformation is performed on the peak-free signal 155. All the stages from the wavelet transformation are eliminated in block 164 except for the n low stage. The n low stage will generally indicate the lowest frequency component of the peak-free signal 155 and therefore will generally indicate the system exponential characteristics. Block 166 shows that a signal is reconstructed from the n low coefficients and the baseline signal 170 is generated in block 168.

[0471] FIG. 39 shows a denoised and shifted data signal 172 positioned adjacent a correction baseline 170. The baseline correction 170 is subtracted from the denoised and shifted signal 172 to generate a signal 175 having a baseline correction applied as shown in FIG. 40. Although such a denoised, shifted, and corrected signal is sufficient for most identification purposes, the putative peaks in signal 175 are not identifiable with sufficient accuracy or confidence to call the DNA composition of a biological sample.

[0472] Referring again to FIG. 25, the data from the baseline correction 50 is now compressed in block 55; the compression technique used in an exemplary embodiment is detailed in FIG. 41. In FIG. 41 the data in the baseline corrected data are presented in an array format 182 with x -axis points 183 having an associated data value 184. The x -axis is indexed by the non-zero wavelet coefficients, and the associated value is the value of the wavelet coefficient. In the illustrated data example in table 182, the maximum value 184 is indicated to be 1000. Although a particularly advantageous compression technique for mass spectrometry data is shown, it will be appreciated that other compression techniques can be used. The data also can be stored without compression.

[0473] In compressing the data according to one embodiment, an intermediate format 186 is generated. The intermediate format 186 generally comprises a real number having a whole number portion 188 and a decimal portion 190. The whole number portion is the x -axis point 183 while the decimal portion is the value data 184 divided by the maximum data value. For example, in the data 182 a data value "25" is indicated at x -axis point "100". The intermediate value for this data point would be "100.025".

[0474] From the intermediate compressed data 186 the final compressed data 195 is generated. The first point of the intermediate data file becomes the starting point for the compressed data. Thereafter each data point in the compressed data 195 is calculated as follows: the whole number portion (left of the decimal) is replaced by the difference between the current and the last whole number. The remainder (right of the decimal) remains intact. For example, the

starting point of the compressed data 195 is shown to be the same as the intermediate data point which is "100.025". The comparison between the first intermediate data point "100.025" and the second intermediate data point "150.220" is "50.220". Therefore, "50.220" becomes the second point of the compressed data 195. In a similar manner, the second intermediate point is "150.220" and the third intermediate data point is "500.0001". Therefore, the third compressed data becomes "350.000". The calculation for determining compressed data points is continued until the entire array of data points is converted to a single array of real numbers.

[0475] FIG. 42 generally describes the method of compressing mass spectrometry data, showing that the data file in block 201 is presented as an array of coefficients in block 202. The data starting point and maximum is determined as shown in block 203, and the intermediate real numbers are calculated in block 204 as described above. With the intermediate data points generated, the compressed data are generated in block 205. The described compression method is highly advantageous and efficient for compressing data sets such as a processed data set from a mass spectrometry instrument. The method is particularly useful for data, such as mass spectrometry data, that uses large numbers and has been processed to have occasional lengthy gaps in x -axis data. Accordingly, an x -y data array for processed mass spectrometry data can be stored with an effective compression rate of 10x or more. Although the compression technique is applied to mass spectrometry data, it will be appreciated that the method can also advantageously be applied to other data sets.

[0476] Referring again to FIG. 25, peak heights are now determined in block 60. The first step in determining peak height is illustrated in FIG. 43 where the signal 210 is shifted left or right to correspond with the position of expected peaks. As the set of possible compositions in the biological sample is known before the mass spectrometry data are generated, the possible positioning of expected peaks is already known. These possible peaks are referred to as expected peaks, such as expected peaks 212, 214, and 216. Due to calibration or other errors in the test instrument data, the entire signal can be shifted left or right from its actual position, therefore, putative peaks located in the signal, such as putative peaks 218, 222, and 224 can be compared to the expected peaks 212, 214, and 216, respectively. The entire signal is then shifted such that the putative peaks align more closely with the expected peaks.

[0477] Once the putative peaks have been shifted to match expected peaks, the strongest putative peak is identified in FIG. 44. In one embodiment, the strongest peak is calculated as a combination of analyzing the overall peak height and area beneath the peak. For example, a moderately high but wide peak would be stronger than a very high peak that is extremely narrow. With the strongest putative peak identified, such as putative peak 225, a Gaussian 228 curve is fit to the peak 225. Once the Gaussian is fit, the width (W) of the Gaussian is determined and will be used as the peak width for future calculations.

[0478] As generally addressed above, the denoised, shifted, and baseline-corrected signal is not sufficiently processed for confidently calling the DNA composition of the biological sample. For example, although the baseline has generally been removed, there are still residual baseline

effects present. These residual baseline effects are therefore removed to increase the accuracy and confidence in making identifications.

[0479] To remove the residual baseline effects, FIG. 45 shows that the putative peaks 218, 222, and 224 are removed from the baseline corrected signal. The peaks are removed by identifying a center line 230, 232, and 234 of the putative peaks 218, 222, and 224, respectively and removing an area to the left and to the right of the identified center line. For each putative peak, an area equal to twice the width (W) of the Gaussian is removed from the left of the center line, while an area equivalent to 50 daltons is removed from the right of the center line. It has been found that the area representing 50 daltons is adequate to sufficiently remove the effect of salt adducts which can be associated with an actual peak. Such adducts appear to the right of an actual peak and are a natural effect from the chemistry involved in acquiring a mass spectrum. Although a 50 Dalton buffer has been selected, it will be appreciated that other ranges or methods can be used to reduce or eliminate adduct effects.

[0480] The peaks are removed and remaining minima 247 located as shown in FIG. 46 with the minima 247 connected to create signal 245. A quartic polynomial is applied to signal 245 to generate a residual baseline 250 as shown in FIG. 47. The residual baseline 250 is subtracted from the signal 225 to generate the final signal 255 as indicated in FIG. 48. Although the residual baseline is the result of a quartic fit to signal 245, it will be appreciated that other techniques can be used to smooth or fit the residual baseline.

[0481] To determine peak height, as shown in FIG. 49, a Gaussian such as Gaussian 266, 268, and 270 is fit to each of the peaks, such as peaks 260, 262, and 264, respectively. Accordingly, the height of the Gaussian is determined as height 272, 274, and 276. Once the height of each Gaussian peak is determined, then the method of identifying a biological compound 35 can move into the genotyping phase 65 as shown in FIG. 25.

[0482] An indication of the confidence that each putative peak is an actual peak can be discerned by calculating a signal-to-noise ratio for each putative peak. Accordingly, putative peaks with a strong signal-to-noise ratio are generally more likely to be an actual peak than a putative peak with a lower signal-to-noise ratio. As described above and shown in FIG. 50, the height of each peak, such as height 272, 274, and 276, is determined for each peak, with the height being an indicator of signal strength for each peak. The noise profile, such as noise profile 97, is extrapolated into noise profile 280 across the identified peaks. At the center line of each of the peaks, a noise value is determined, such as noise value 282, 283, and 284. With a signal values and a noise values generated, signal-to-noise ratios can be calculated for each peak. For example, the signal-to-noise ratio for the first peak in FIG. 50 would be calculated as signal value 272 divided by noise value 282, and in a similar manner the signal-to-noise ratio of the middle peak in FIG. 50 would be determined as signal 274 divided by noise value 283.

[0483] Although the signal-to-noise ratio is generally a useful indicator of the presence of an actual peak, further processing has been found to increase the confidence by which a sample can be identified. For example, the signal-to-noise ratio for each peak in the exemplary embodiment

can be adjusted by the goodness of fit between a Gaussian and each putative peak. It is a characteristic of a mass spectrometer that sample material is detected in a manner that generally complies with a normal distribution. Accordingly, greater confidence will be associated with a putative signal having a Gaussian shape than a signal that has a less normal distribution. The error resulting from having a non-Gaussian shape can be referred to as a "residual error".

[0484] Referring to FIG. 51, a residual error is calculated by taking a root mean square calculation between the Gaussian 293 and the putative peak 290 in the data signal. The calculation is performed on data within one width on either side of a center line of the Gaussian. The residual error is calculated as:

$$\sqrt{[(G-R)^2/N]},$$

[0485] where G is the Gaussian signal value, R is the putative peak value, and N is the number of points from -W to +W. The calculated residual error is used to generate an adjusted signal-to-noise ratio, as described below.

[0486] An adjusted signal noise ratio is calculated for each putative peak using the formula $(S/N) * \text{EXP}^{(-1/R^2)}$, where S/N is the signal-to-noise ratio, and R is the residual error determined above. Although the exemplary embodiment calculates an adjusted signal-to-noise ratio using a residual error for each peak, it will be appreciated that other techniques can be used to account for the goodness of fit between the Gaussian and the actual signal.

[0487] Referring now to FIG. 52, a probability is determined that a putative peak is an actual peak. In making the determination of peak probability, a probability profile 300 is generated where the adjusted signal-to-noise ratio is the x-axis and the probability is the y-axis. Probability is necessarily in the range between a 0% probability and a 100% probability, which is indicated as 1. Generally, the higher the adjusted signal-to-noise ratio, the greater the confidence that a putative peak is an actual peak.

[0488] At some target value for the adjusted signal-to-noise, it has been found that the probability is 100% that the putative peak is an actual peak and can confidently be used to identify the DNA composition of a biological sample. The target value of adjusted signal-to-noise ratio where the probability is assumed to be 100% is a variable parameter which is to be set according to application specific criteria. For example, the target signal-to-noise ratio will be adjusted depending upon trial experience, sample characteristics, and the acceptable error tolerance in the overall system. More specifically, for situations requiring a conservative approach where error cannot be tolerated, the target adjusted signal-to-noise ratio can be set to, for example, 10 and higher. Accordingly, 100% probability will not be assigned to a peak unless the adjusted signal-to-noise ratio is 10 or over.

[0489] In other situations, a more aggressive approach can be taken as sample data is more pronounced or the risk of error can be reduced. In such a situation, the system can be set to assume a 100% probability with a 5 or greater target signal-to-noise ratio. Of course, an intermediate signal-to-noise ratio target figure can be selected, such as 7, when a moderate risk of error can be assumed. Once the target adjusted signal-to-noise ratio is set for the method, then for

any adjusted signal-to-noise ratio a probability can be determined that a putative peak is an actual peak.

[0490] Due to the chemistry involved in performing an identification test, especially a mass spectrometry test of a sample prepared by DNA amplifications, the allelic ratio between the signal strength of the highest peak and the signal strength of the second (or third and so on) highest peak should fall within an expected ratio. If the allelic ratio falls outside of normal guidelines, the exemplary embodiment imposes an allelic ratio penalty to the probability. For example, FIG. 53 shows an allelic penalty 315 which has an x-axis 317 that is the ratio between the signal strength of the second highest peak divided by signal strength of the highest peak. The y-axis 319 assigns a penalty between 0 and 1 depending on the determined allelic ratio. In the exemplary embodiment, it is assumed that allelic ratios over 30% are within the expected range and therefore no penalty is applied. Between a ratio of 10% and 30%, the penalty is linearly increased until at allelic ratios below 10% it is assumed the second-highest peak is not real. For allelic ratios between 10% and 30%, the allelic penalty chart 315 is used to determine a penalty 319, which is multiplied by the peak probability determined in FIG. 52 to determine a final peak probability. Although the exemplary embodiment incorporates an allelic ratio penalty to account for a possible chemistry error, it will be appreciated that other techniques can be used. Similar treatment will be applied to the other peaks.

[0491] With the peak probability of each peak determined, the statistical probability for various composition components can be determined, as an example, in order to determine the probability of each of three possible combinations of two peaks,—peak G, peak C and combinations GG, CC and GC. FIG. 54 shows an example where a most probable peak 325 is determined to have a final peak probability of 90%. Peak 325 is positioned such that it represents a G component in the biological sample. Accordingly, it can be maintained that there is a 90% probability that G exists in the biological sample. Also in the example shown in FIG. 54, the second highest probability is peak 330 which has a peak probability of 20%. Peak 330 is at a position associated with a C composition. Accordingly, it can be maintained that there is a 20% probability that C exists in the biological sample.

[0492] With the probability of G existing (90%) and the probability of C existing (20%) as a starting point, the probability of combinations of G and C existing can be calculated. For example, FIG. 54 indicates that the probability of GG existing 329 is calculated as 72%. This is calculated as the probability of GG is equal to the probability of G existing (90%) multiplied by the probability of C not existing (100% – 20%). So if the probability of G existing is 90% and the probability of C not existing is 80%, the probability of GG is 72%.

[0493] In a similar manner, the probability of CC existing is equivalent to the probability of C existing (20%) multiplied by the probability of G not existing (100% – 90%). As shown in FIG. 54, the probability of C existing is 20% while the probability of G not existing is 10%, so therefore the probability of CC is only 2%. Finally, the probability of GC existing is equal to the probability of G existing (90%) multiplied by the probability of C existing (20%). So if the

probability of G existing is 90% and the probability of C existing is 20%, the probability of GC existing is 18%. In summary form, then, the probability of the composition of the biological sample is:

probability of GG:	72%;
probability of GC:	18%; and
probability of CC:	2%.

[0494] Once the probabilities of each of the possible combinations has been determined, FIG. 55 is used to decide whether or not sufficient confidence exists to call the genotype. FIG. 55 shows a call chart 335 which has an x-axis 337 which is the ratio of the highest combination probability to the second highest combination probability. The y-axis 339 simply indicates whether the ratio is sufficiently high to justify calling the genotype. The value of the ratio can be indicated by M 340. The value of M is set depending upon trial data, sample composition, and the ability to accept error. For example, the value M can be set relatively high, such as to a value 4 so that the highest probability must be at least four times greater than the second highest probability before confidence is established to call a genotype. If a certain level of error can be acceptable, the value of M can be set to a more aggressive value, such as to 3, so that the ratio between the highest and second highest probabilities needs to be only a ratio of 3 or higher. Of course, moderate value can be selected for M when a moderate risk can be accepted. Using the example of FIG. 54, where the probability of GG was 72% and the probability of GC was 18%, the ratio between 72% and 18% is 4.0, therefore, whether M is set to 3, 3.5, or 4, the system would call the genotype as GG. Although the exemplary embodiment uses a ratio between the two highest peak probabilities to determine if a genotype confidently can be called, it will be appreciated that other methods can be substituted. It will also be appreciated that the above techniques can be used for calculating probabilities and choosing genotypes (or more general DNA patterns) containing of combinations of more than two peaks.

[0495] Referring now to FIG. 56, a flow chart is shown generally defining the process of statistically calling genotype described above. In FIG. 56 block 402 shows that the height of each peak is determined and that in block 404 a noise profile is extrapolated for each peak. The signal is determined from the height of each peak in block 406 and the noise for each peak is determined using the noise profile in block 408. In block 410, the signal-to-noise ratio is calculated for each peak. To account for a non-Gaussian peak shape, a residual error is determined in block 412 and an adjusted signal-to-noise ratio is calculated in block 414. Block 416 shows that a probability profile is developed, with the probability of each peak existing found in block 418. An allelic penalty can be applied in block 420, with the allelic penalty applied to the adjusted peak probability in block 422. The probability of each combination of components is calculated in block 424 with the ratio between the two highest probabilities being determined in block 426. If the ratio of probabilities exceeds a threshold value then the genotype is called in block 428.

[0496] In another embodiment, the computing device 20 (FIG. 24) supports “standardless” genotyping by identifying

data peaks that contain putative SNPs. Standardless genotyping is used, for example, where insufficient information is known about the samples to determine a distribution of expected peak locations, against which an allelic penalty as described above can be reliably calculated. This permits the computing device to be used for identification of peaks that contain putative SNPs from data generated by any assay that fragments a targeted DNA molecule. For such standardless genotyping, peaks that are associated with an area under the data curve that deviates significantly from the typical area of other peaks in the data spectrum are identified and their corresponding mass (location along the x-axis) is determined.

[0497] More particularly, peaks that deviate significantly from the average area of other peaks in the data are identified, and the expected allelic ratio between data peaks is defined in terms of the ratio of the area under the data peaks. Theoretically, where each genetic loci has the same molar concentration of analyte, the area under each corresponding peak should be the same, thus producing a 1.0 ratio of the peak area between any two peaks. In accordance with the methods provided herein, peaks having a smaller ratio relative to the other peaks in the data will not be recognized as peaks. More particularly, peaks having an area ratio smaller than 30% relative to a nominal value for peak area will be assigned an allelic penalty. The mass of the remaining peaks (their location along the x-axis of the data) will be determined based on oligonucleotide standards.

[0498] FIG. 57 shows a flow diagram representation of the processing by the computing device 20 (FIG. 24) when performing standardless genotyping. In the first operation, represented by the flow diagram box numbered 502, the computing device receives data from the mass spectrometer. Next, the height of each putative peak in the data sample is determined, as indicated by the block 504. After the height of each peak in the mass spectrometer data is determined, a de-noise process 505 is performed, beginning with an extrapolation of the noise profile (block 506), followed by finding the noise of each peak (block 508) and calculating the signal to noise ratio for each data sample (block 510). Each of these operations can be performed in accordance with the description above for denoise operations 45 of FIG. 25. Other suitable denoise operations will occur to those skilled in the art.

[0499] The next operation is to find the residual error associated with each data point. This is represented by the block 512 in FIG. 57. The next step, block 514, involves calculating an adjusted signal to noise ratio for each identified peak. A probability profile is developed next (block 516), followed by a determination of the peak probabilities at block 518. In an exemplary embodiment, the denoise operations of FIG. 57, comprising block 502 to block 518, comprise the corresponding operations described above in conjunction with FIG. 56 for block 402 through block 418, respectively.

[0500] The next action for the standardless genotype processing is to determine an allelic penalty for each peak, indicated by the block 524. As noted above, the standardless genotype processing of FIG. 57 determines an allelic penalty by comparing area under the peaks. Therefore, rather than compare signal strength ratios to determine an allelic penalty, such as described above for FIG. 53, the standard-

less processing determines the area under each of the identified peaks and compares the ratio of those areas. Determining the area under each peak can be computed using conventional numerical analysis techniques for calculating the area under a curve for experimental data.

[0501] Thus, the allelic penalty is assigned in accordance with FIG. 58, which shows that no penalty is assigned to peaks having a peak area relative to an expected average area value that is greater than 0.30 (30%). The allelic penalty is applied to the peak probability value, which can be determined according to the process such as described in FIG. 52. It should be apparent from FIG. 58 that the allelic penalty imposed for peaks below a ratio of 30% is that such peaks will be removed from further measurement and processing. Other penalty schemes, however, can be imposed in accordance with knowledge about the data being processed, as determined by those skilled in the art.

[0502] After the allelic penalty has been determined and applied, the standardless genotype processing compares the location of the remaining putative peaks to oligonucleotide standards to determine corresponding masses in the processing for block 524. For standardless genotype data, the processing of the block 524 is performed to determine mass and genotype, rather than performing the operations corresponding to block 424, 426, and 428 of FIG. 33. Techniques for performing such comparisons and determining mass will be known to those skilled in the art.

[0503] In another embodiment, the computing device 20 (FIG. 24) permits the detection and determination of the mass (location along the x-axis of the data) of the sense and antisense strand of fragments generated in the assay. If desired, the computing device can also detect and determine the quantity (area under each peak) of the respective sense and antisense strands, using a similar technique to that described above for standardless genotype processing. The data generated for each type of strand can then be combined to achieve a data redundancy and to thereby increase the confidence level of the determined genotype. This technique obviates primer peaks that are often observed in data from other diagnostic methods, thereby permitting a higher level of multiplexing. In addition, when quantitation is used in pooling experiments, the ratio of the measured peak areas is more reliably calculated than the peak identifying technique, due to data redundancy.

[0504] FIG. 23 is a flow diagram that illustrates the processing implemented by the computing device 20 to perform sense and antisense processing. In the first operation, represented by the flow diagram box numbered 602, the computing device receives data from the mass spectrometer. This data will include data for the sense strand and antisense strand of assay fragments. Next, the height of each putative peak in the data sample is determined, as indicated by the block 604. After the height of each peak in the mass spectrometer data is determined, a de-noise process 605 is performed, beginning with an operation that extrapolates the noise profile (block 606), followed by finding the noise of each peak (block 608) and calculating the signal to noise ratio for each data sample (block 610). Each of these operations can be performed in accordance with the description above for the denoise operations 45 of FIG. 25. Other suitable denoise operations will occur to those skilled in the

[0507] Since modifications will be apparent to those of skill in this art, it is intended that this invention be limited only by the scope of the appended claims.

<160> NUMBER OF SEQ ID NOS: 118	
<210> SEQ ID NO 1	
<211> LENGTH: 361	
<212> TYPE: DNA	
<213> ORGANISM: Homo Sapien	
<400> SEQUENCE: 1	
ctgaggagacct ggctcctctga ctgctctttt caccatctta cagtcacctt tgcgcgtccca	60
agcaatggat gatttgaatg tgcctccgga cgaatatgaa caatgggtca ctgaagaccc	120
aggtccagat gaagctccca gaatgccaga ggctgctccc cgctgtggccc ctgcaccagc	180
agctactaca cggcgggccc ctgcaccaga cccctactgg ccactgtcat attctgtacc	240
ttccccagaaa acctaccagg gcagctacgg ttcccgctg ggctctcttc attctgggac	300
agcccaagtct gtgacttgca cggtcagttg ccttgagggg ctggcttcca tgagacttca	360
a	361
<210> SEQ ID NO 2	
<211> LENGTH: 44	
<212> TYPE: DNA	
<213> ORGANISM: Artificial Sequence	
<220> FEATURE:	
<223> OTHER INFORMATION: Oligonucleotide Primer	
<400> SEQUENCE: 2	
cccagtcacg acgttgttaa acgctgagga cctggctctc tgac	44
<210> SEQ ID NO 3	
<211> LENGTH: 42	
<212> TYPE: DNA	
<213> ORGANISM: Artificial Sequence	
<220> FEATURE:	
<223> OTHER INFORMATION: Oligonucleotide Primer	
<400> SEQUENCE: 3	
aggggataac aatttcacac aggttgaagt ctcatggaag cc	42
<210> SEQ ID NO 4	

 -continued

```

<211> LENGTH: 17
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 4

gccagaggct gctcccc                                     17

<210> SEQ ID NO 5
<211> LENGTH: 17
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 5

gccagaggct gctcccc                                     17

<210> SEQ ID NO 6
<211> LENGTH: 19
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 6

gccagaggct gctccccgc                                  19

<210> SEQ ID NO 7
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 7

gccagaggct gctcccc                                     18

<210> SEQ ID NO 8
<211> LENGTH: 161
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien

<400> SEQUENCE: 8

gtccgtcaga aaccatgcgg cagcaaggcc tgcgcgcgcc tcttcggccc agtggacagc   60
gagcagctga gccgcgactg tgatgcgcta atggcgggct gcattccagga ggcccgtag   120
cgatggaact tcgactttgt caccgagaca ccactggagg g                               161

<210> SEQ ID NO 9
<211> LENGTH: 43
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 9

cccagtcacg acgttgtaaa acggtcagtc agaacccatg cgg                               43

<210> SEQ ID NO 10
<211> LENGTH: 44
<212> TYPE: DNA

```

-continued

```

<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 10
agcggataac aatttcacac aggcctccagt ggtgtctcgg tgac          44

<210> SEQ ID NO 11
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 11
cagcgagcag ctgag          15

<210> SEQ ID NO 12
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 12
cagcgagcag ctgag          15

<210> SEQ ID NO 13
<211> LENGTH: 16
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 13
cagcgagcag ctgagc          16

<210> SEQ ID NO 14
<211> LENGTH: 17
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 14
cagcgagcag ctgagac          17

<210> SEQ ID NO 15
<211> LENGTH: 205
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien

<400> SEQUENCE: 15
gcgctccatt catctcttca tcgactctct gttgaatgaa gaaaatccaa gtaaggccta          60
caggtgcagt tccaaaggag ccttlgagaa aggcctctgc ttgagttgta gaaagaaccc          120
ctgcaacaat ctgggctatg agatcaataa agtcagagcc aaaagaagca gcaaaatgta          180
cctgaagact cgttctcaga tgccc          205

<210> SEQ ID NO 16
<211> LENGTH: 42
<212> TYPE: DNA

```


-continued

```

<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primers

<400> SEQUENCE: 16
cccagtcacg acgttgtaaa acggcgctcc attcatctct tc                42

<210> SEQ ID NO 17
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 17
agcggataac aatttcacac agggggcctc tgagaacgag tc                42

<210> SEQ ID NO 18
<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 18
caatctgggc tatgatcatca                20

<210> SEQ ID NO 19
<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 19
caatctgggc tatgatcatca                20

<210> SEQ ID NO 20
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 20
caatctgggc tatgatcatca a                21

<210> SEQ ID NO 21
<211> LENGTH: 22
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 21
caatctgggc tatgatcatca gt                22

<210> SEQ ID NO 22
<211> LENGTH: 60
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<220> FEATURE:
<223> OTHER INFORMATION: Probe

```

-continued

<400> SEQUENCE: 22	
gtgcggcgcta ctgggatggc agcaaggact cctgcgaagg ggacagtgga ggccacatg	60
<210> SEQ ID NO 23	
<211> LENGTH: 60	
<212> TYPE: DNA	
<213> ORGANISM: Homo sapien	
<400> SEQUENCE: 23	
ccaccaccta ccggggcagc tggtagctga cgggcctcgt cagctggggc cagggctgcg	60
<210> SEQ ID NO 24	
<211> LENGTH: 42	
<212> TYPE: DNA	
<213> ORGANISM: Artificial Sequence	
<220> FEATURE:	
<223> OTHER INFORMATION: Oligonucleotide primer	
<400> SEQUENCE: 24	
cccagtcacg acgttgtaaa acgatggcag caaggactcc tg	42
<210> SEQ ID NO 25	
<211> LENGTH: 18	
<212> TYPE: DNA	
<213> ORGANISM: Artificial Sequence	
<220> FEATURE:	
<223> OTHER INFORMATION: Oligonucleotide primer	
<400> SEQUENCE: 25	
cacatgccac ccactacc	18
<210> SEQ ID NO 26	
<211> LENGTH: 43	
<212> TYPE: DNA	
<213> ORGANISM: Artificial Sequence	
<220> FEATURE:	
<223> OTHER INFORMATION: Oligonucleotide primer	
<400> SEQUENCE: 26	
agcgggataac attttcacac aggtgacgat gcccgtcagg tac	43
<210> SEQ ID NO 27	
<211> LENGTH: 15	
<212> TYPE: DNA	
<213> ORGANISM: Artificial Sequence	
<220> FEATURE:	
<223> OTHER INFORMATION: Probe	
<400> SEQUENCE: 27	
atgccaccca ctacc	15
<210> SEQ ID NO 28	
<211> LENGTH: 19	
<212> TYPE: DNA	
<213> ORGANISM: Artificial Sequence	
<220> FEATURE:	
<223> OTHER INFORMATION: Probe	
<400> SEQUENCE: 28	
cacatgccac ccactaccg	19
<210> SEQ ID NO 29	

-continued

```

<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 29
cacatgccac ccactaccag                20

<210> SEQ ID NO 30
<211> LENGTH: 23
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 30
agcggataac aattcacac agg                23

<210> SEQ ID NO 31
<211> LENGTH: 2363
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<220> FEATURE:
<221> NAME/KEY: CDS
<222> LOCATION: (138)...(2126)
<223> OTHER INFORMATION: AKAP-10
<300> PUBLICATION INFORMATION:
<303> DATABASE ACCESSION NUMBER: GenBank AF037439
<309> DATABASE ENTRY DATE: 1997-12-21

<400> SEQUENCE: 31
cgcgcttggt gataatatgg cggtctggagc tgcctgggca tcccgaggag gcggtggggc    60
ccactcccgg aagaagggtc ccttttcgcg ctagtgcagc ggccccctcg gaccgggaag    120
tcggggccgg ttgtga atg agg gga gcc ggg ccc tcc ccg cgc cag tcc    170
      Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser
      1          5          10
ccc cgc acc ctc cgt ccc gac ccg ggc ccc gcc atg tcc ttc ttc cgg    218
Pro Arg Thr Leu Arg Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg
      15          20          25
cgg aaa gtg aaa ggc aaa gaa caa gag aag acc tca gat gtg aag tcc    266
Arg Lys Val Lys Gly Lys Glu Gln Glu Lys Thr Ser Asp Val Lys Ser
      30          35          40
att aaa gct tca ata tcc gta cat tcc cca caa aaa agc act aaa aat    314
Ile Lys Ala Ser Ile Ser Val His Ser Pro Gln Lys Ser Thr Lys Asn
      45          50          55
cat gcc ttg ctg gag gct gca gga cca agt cat gtt gca atc aat gcc    362
His Ala Leu Leu Glu Ala Ala Gly Pro Ser His Val Ala Ile Asn Ala
      60          65          70          75
att tct gcc aac atg gac tcc ttt tca agt agc agg aca gcc aca ctt    410
Ile Ser Ala Asn Met Asp Ser Phe Ser Ser Ser Arg Thr Ala Thr Leu
      80          85          90
aag aag cag cca agc cac atg gag gct gct cat ttt ggt gac ctg ggc    458
Lys Lys Gln Pro Ser His Met Glu Ala Ala His Phe Gly Asp Leu Gly
      95          100          105
aga tct tgt ctg gac tac cag act caa gag acc aaa tca agc ctt tct    506
Arg Ser Cys Leu Asp Tyr Gln Thr Gln Glu Thr Lys Ser Ser Leu Ser
      110          115          120
aag acc ctt gaa caa gtc ttg cac gac act att gtc ctc cct tac ttc    554
Lys Thr Leu Glu Gln Val Leu His Asp Thr Ile Val Leu Pro Tyr Phe
      125          130          135

```

-continued

att caa ttc atg gaa ctt cgg cga atg gag cat ttg gtg aaa ttt tgg Ile Gln Phe Met Glu Leu Arg Arg Met Glu His Leu Val Lys Phe Trp 140 145 150 155	602
tta gag gct gaa agt ttt cat tca aca act tgg tgg cga ata aga gca Leu Glu Ala Glu Ser Phe His Ser Thr Thr Trp Ser Arg Ile Arg Ala 160 165 170	650
cac agt cta aac aca atg aag cag agc tca ctg gct gag cct gtc tot His Ser Leu Asn Thr Met Lys Gln Ser Ser Leu Ala Glu Pro Val Ser 175 180 185	698
cca tct aaa aag cat gaa act aca gcg tct ttt tta act gat tct ctt Pro Ser Lys Lys His Glu Thr Thr Ala Ser Phe Leu Thr Asp Ser Leu 190 195 200	746
gat aag aga ttg gag gat tct ggc tca gca cag ttg ttt atg act cat Asp Lys Arg Leu Glu Asp Ser Gly Ser Ala Gln Leu Phe Met Thr His 205 210 215	794
tca gaa gga att gac ctg aat aat aga act aac agc act cag aat cac Ser Glu Gly Ile Asp Leu Asn Asn Arg Thr Asn Ser Thr Gln Asn His 220 225 230 235	842
ttg ctg ctt tcc cag gaa tgt gac agt gcc cat tct ctg cgt ctt gaa Leu Leu Leu Ser Gln Glu Cys Asp Ser Ala His Ser Leu Arg Leu Glu 240 245 250	890
atg gcc aga gca gga act cac caa gtt tcc atg gaa acc caa gaa tct Met Ala Arg Ala Gly Thr His Gln Val Ser Met Glu Thr Gln Glu Ser 255 260 265	938
tcc tot aca ctt aca gta gcc agt aga aat agt ccc gct tct cca cta Ser Ser Thr Leu Thr Val Ala Ser Arg Asn Ser Pro Ala Ser Pro Leu 270 275 280	986
aaa gaa ttg tca gga aaa cta atg aaa agt ata gaa caa gat gca gtg Lys Glu Leu Ser Gly Lys Leu Met Lys Ser Ile Glu Gln Asp Ala Val 285 290 295	1034
aat act ttt acc aaa tat ata tct cca gat gct gct aaa cca ata cca Asn Thr Phe Thr Lys Tyr Ile Ser Pro Asp Ala Ala Lys Pro Ile Pro 300 305 310 315	1082
att aca gaa gca atg aga aat gac atc ata gca agg att tgt gga gaa Ile Thr Glu Ala Met Arg Asn Asp Ile Ile Ala Arg Ile Cys Gly Glu 320 325 330	1130
gat gga cag gtg gat ccc aac tgt ttc gtt ttg gca cag tcc ata gtc Asp Gly Gln Val Asp Pro Asn Cys Phe Val Leu Ala Gln Ser Ile Val 335 340 345	1178
ttt agt gca atg gag caa gag cac ttt agt gag ttt ctg cga agt cac Phe Ser Ala Met Glu Gln Glu His Phe Ser Glu Phe Leu Arg Ser His 350 355 360	1226
cat ttc tgt aaa tac cag att gaa gtg ctg acc agt gga act gtt tac His Phe Cys Lys Tyr Gln Ile Glu Val Leu Thr Ser Gly Thr Val Tyr 365 370 375	1274
ctg gct gac att ctg ttc tgt gag tca gcc ctg ttt tat ttc tot gag Leu Ala Asp Ile Leu Phe Cys Glu Ser Ala Leu Phe Tyr Phe Ser Glu 380 385 390 395	1322
tac atg gaa aaa gag gat gca gtg aat atc tta caa ttc tgg ttg gca Tyr Met Glu Lys Glu Asp Ala Val Asn Ile Leu Gln Phe Trp Leu Ala 400 405 410	1370
gca gat aac ttc cag tct cag ctt gct gcc aaa aag ggg caa tat gat Ala Asp Asn Phe Gln Ser Gln Leu Ala Ala Lys Lys Gly Gln Tyr Asp 415 420 425	1418
gga cag gag gca cag aat gat gcc atg att tta tat gac aag tac ttc Gly Gln Glu Ala Gln Asn Asp Ala Met Ile Leu Tyr Asp Lys Tyr Phe 430 435 440	1466

-continued

tcc ctc caa gcc aca cat cct ctt gga ttt gat gat gtt gta cga tta Ser Leu Gln Ala Thr His Pro Leu Gly Phe Asp Asp Val Val Arg Leu 445 450 455	1514
gaa att gaa tcc aat atc tgc agg gaa ggt ggg cca ctc ccc aac tgt Glu Ile Glu Ser Asn Ile Cys Arg Glu Gly Gly Pro Leu Pro Asn Cys 460 465 470 475	1562
ttc aca act cca tta cgt cag gcc tgg aca acc atg gag aag gtc ttt Phe Thr Thr Pro Leu Arg Gln Ala Trp Thr Thr Met Glu Lys Val Phe 480 485 490	1610
ttg cct ggc ttt ctg tcc agc aat ctt tat tat aaa tat ttg aat gat Leu Pro Gly Phe Leu Ser Ser Asn Leu Tyr Tyr Lys Tyr Leu Asn Asp 495 500 505	1658
ctc atc cat tcg gtt cga gga gat gaa ttt ctg ggc ggg aac gtg tcg Leu Ile His Ser Val Arg Gly Asp Glu Phe Leu Gly Gly Asn Val Ser 510 515 520	1706
ccg act gct cct ggc tct gtt ggc cct cct gat gag tct cac cca ggg Pro Thr Ala Pro Gly Ser Val Gly Pro Pro Asp Glu Ser His Pro Gly 525 530 535	1754
agt tat gac agc tct gcg tct cag tcc agt gtg aaa aaa gcc agt att Ser Ser Asp Ser Ser Ala Ser Gln Ser Ser Val Lys Lys Ala Ser Ile 540 545 550 555	1802
aaa ata ctg aaa aat ttt gat gaa gcg ata att gtg gat gcg gca agt Lys Ile Leu Lys Asn Phe Asp Glu Ala Ile Ile Val Asp Ala Ala Ser 560 565 570	1850
ctg gat cca gaa tct tta tat caa cgg aca tat gcc ggg aag atg aca Leu Asp Pro Glu Ser Leu Tyr Gln Arg Thr Tyr Ala Gly Lys Met Thr 575 580 585	1898
ttt gga aga gtg agt gac ttg ggg caa ttc atc cgg gaa tct gag cct Phe Gly Arg Val Ser Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro 590 595 600	1946
gaa cct gat gta agg aaa tca aaa gga tcc atg ttc tca caa gat atg Glu Pro Asp Val Arg Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met 605 610 615	1994
aag aaa tgg gtg caa gga aat act gat gag gcc cag gaa gag cta gct Lys Lys Trp Val Gln Gly Asn Thr Asp Glu Ala Gln Glu Leu Ala 620 625 630 635	2042
tgg aag att gct aaa atg ata gtc agt gac att atg cag cag gct cag Trp Lys Ile Ala Lys Met Ile Val Ser Asp Ile Met Gln Gln Ala Gln 640 645 650	2090
tat gat caa ccg tta gag aaa tct aca aag tta tga ctcaaaactt Tyr Asp Gln Pro Leu Glu Lys Ser Thr Lys Leu * 655 660	2136
gagataaagg aaatctgctt gtgaaaaata agagaacttt ttcccttgg ttggattcct	2196
caacacagcc aatgaaaaca gcaatatatt tctgatctgt cactgttggt tccagggaga	2256
gaatggggag acaatcctag gaactccacc ctaatgcagt taactgtagg gcataattgg	2316
atggcacatg atgtttcaca cagtggagg tctttaaagg ttaccaa	2363

<210> SEQ ID NO 32

<211> LENGTH: 662

<212> TYPE: PRN

<213> ORGANISM: Homo Sapien

<400> SEQUENCE: 32

Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser Pro Arg Thr Leu Arg	
1 5 10 15	

-continued

Pro Asp	Pro Gly	Pro Ala	Met Ser	Phe Phe	Arg Arg	Lys Val	Lys Gly		
	20			25		30			
Lys Glu	Gln Glu	Lys Thr	Ser Asp	Val Lys	Ser Ile	Lys Ala	Ser Ile		
	35		40		45				
Ser Val	His Ser	Pro Gln	Lys Ser	Thr Lys	Asn His	Ala Leu	Leu Glu		
	50		55		60				
Ala Ala	Gly Pro	Ser His	Val Ala	Ile Asn	Ala Ile	Ser Ala	Asn Met		
	65		70		75		80		
Asp Ser	Phe Ser	Ser Ser	Arg Thr	Ala Thr	Leu Lys	Lys Gln	Pro Ser		
		85		90			95		
His Met	Glu Ala	Ala His	Phe Gly	Asp Leu	Gly Arg	Ser Cys	Leu Asp		
	100		105			110			
Tyr Gln	Thr Gln	Glu Thr	Lys Ser	Leu Ser	Lys Thr	Leu Glu	Gln		
	115		120		125				
Val Leu	His Asp	Thr Ile	Val Leu	Pro Tyr	Phe Ile	Gln Phe	Met Glu		
	130		135		140				
Leu Arg	Arg Met	Glu His	Leu Val	Lys Phe	Trp Leu	Glu Ala	Glu Ser		
	145		150		155		160		
Phe His	Ser Thr	Thr Trp	Ser Arg	Ile Arg	Ala His	Ser Leu	Asn Thr		
		165		170			175		
Met Lys	Gln Ser	Ser Leu	Ala Glu	Pro Val	Ser Pro	Ser Lys	Lys His		
	180		185			190			
Glu Thr	Thr Ala	Ser Phe	Leu Thr	Asp Ser	Leu Asp	Lys Arg	Leu Glu		
	195		200		205				
Asp Ser	Gly Ser	Ala Gln	Leu Phe	Met Thr	His Ser	Glu Gly	Ile Asp		
	210		215		220				
Leu Asn	Asn Arg	Thr Asn	Ser Thr	Gln Asn	His Leu	Leu Leu	Ser Gln		
	225		230		235		240		
Glu Cys	Asp Ser	Ala His	Ser Leu	Arg Leu	Glu Met	Ala Arg	Ala Gly		
		245		250		255			
Thr His	Gln Val	Ser Met	Glu Thr	Gln Glu	Ser Ser	Ser Thr	Leu Thr		
	260		265			270			
Val Ala	Ser Arg	Asn Ser	Pro Ala	Ser Pro	Leu Lys	Glu Leu	Ser Gly		
	275		280			285			
Lys Leu	Met Lys	Ser Ile	Glu Gln	Asp Ala	Val Asn	Thr Phe	Thr Lys		
	290		295		300				
Tyr Ile	Ser Pro	Asp Ala	Ala Lys	Pro Ile	Pro Ile	Thr Glu	Ala Met		
	305		310		315		320		
Arg Asn	Asp Ile	Ile Ala	Arg Ile	Cys Gly	Glu Asp	Gly Gln	Val Asp		
		325		330		335			
Pro Asn	Cys Phe	Val Leu	Ala Gln	Ser Ile	Val Phe	Ser Ala	Met Glu		
		340		345		350			
Gln Glu	His Phe	Ser Glu	Phe Leu	Arg Ser	His His	Phe Cys	Lys Tyr		
	355		360		365				
Gln Ile	Glu Val	Leu Thr	Ser Gly	Thr Val	Tyr Leu	Ala Asp	Ile Leu		
	370		375		380				
Phe Cys	Glu Ser	Ala Leu	Phe Tyr	Phe Ser	Glu Tyr	Met Glu	Lys Glu		
	385		390		395		400		
Asp Ala	Val Asn	Ile Leu	Gln Phe	Trp Leu	Ala Ala	Asp Asn	Phe Gln		
		405		410		415			
Ser Gln	Leu Ala	Ala Lys	Lys Gly	Gln Tyr	Asp Gly	Gln Glu	Ala Gln		

-continued

420	425	430
Asn Asp Ala Met Ile Leu Tyr	Asp Lys Tyr Phe Ser Leu Gln Ala Thr	
435	440	445
His Pro Leu Gly Phe Asp	Asp Val Val Arg Leu Glu Ile Glu Ser Asn	
450	455	460
Ile Cys Arg Glu Gly Gly Pro Leu Pro Asn Cys Phe Thr Thr Pro Leu		
465	470	475
Arg Gln Ala Trp Thr Thr Met Glu Lys Val Phe Leu Pro Gly Phe Leu		
485	490	495
Ser Ser Asn Leu Tyr Tyr Lys Tyr Leu Asn Asp Leu Ile His Ser Val		
500	505	510
Arg Gly Asp Glu Phe Leu Gly Gly Asn Val Ser Pro Thr Ala Pro Gly		
515	520	525
Ser Val Gly Pro Pro Asp Glu Ser His Pro Gly Ser Ser Asp Ser Ser		
530	535	540
Ala Ser Gln Ser Ser Val Lys Lys Ala Ser Ile Lys Ile Leu Lys Asn		
545	550	555
Phe Asp Glu Ala Ile Ile Val Asp Ala Ala Ser Leu Asp Pro Glu Ser		
565	570	575
Leu Tyr Gln Arg Thr Tyr Ala Gly Lys Met Thr Phe Gly Arg Val Ser		
580	585	590
Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro Glu Pro Asp Val Arg		
595	600	605
Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met Lys Lys Trp Val Gln		
610	615	620
Gly Asn Thr Asp Glu Ala Gln Glu Glu Leu Ala Trp Lys Ile Ala Lys		
625	630	635
Met Ile Val Ser Asp Ile Met Gln Gln Ala Gln Tyr Asp Gln Pro Leu		
645	650	655
Glu Lys Ser Thr Lys Leu		
660		
<210> SEQ ID NO 33		
<211> LENGTH: 2363		
<212> TYPE: DNA		
<213> ORGANISM: Homo Sapien		
<220> FEATURE:		
<221> NAME/KEY: CDS		
<222> LOCATION: (138)...(2126)		
<223> OTHER INFORMATION: AKAP-10-5		
<220> FEATURE:		
<221> NAME/KEY: allele		
<222> LOCATION: 2073		
<223> OTHER INFORMATION: Single Nucleotide Polymorphism: A to G		
<400> SEQUENCE: 33		
gogggctgtgtt gataaatatgg cggtctggagc tgccctgggca toccgaggag gcggtggggc	60	
ccactcccg gagaagggtc ccttttcgcg ctagtgcagc ggccctctg gaccggaag	120	
tcggggccgg ttgtcta atg agg gga gcc ggg ccc tcc ccg cgc cag tcc	170	
Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser	1	10
ccc cgc acc ctg cgt ccc gac ccg ggc ccc gcc atg tcc ttc ttc cgg	218	
Pro Arg Thr Leu Arg Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg	15	20 25
cgg aaa gtg aaa ggc aaa gaa caa gag aag acc tca gat gtg aag tcc	266	

-continued

Arg	Lys	Val	Lys	Gly	Lys	Glu	Gln	Glu	Lys	Thr	Ser	Asp	Val	Lys	Ser	
		30						35					40			
att	aaa	gct	tca	ata	tcc	gta	cat	tcc	cca	caa	aaa	agc	act	aaa	aat	314
Ile	Lys	Ala	Ser	Ile	Ser	Val	His	Ser	Pro	Gln	Lys	Ser	Thr	Lys	Asn	
	45					50					55					
cat	goc	ttg	ctg	gag	gct	gca	gga	cca	agt	cat	gtt	gca	atc	aat	goc	362
His	Ala	Leu	Leu	Glu	Ala	Ala	Gly	Pro	Ser	His	Val	Ala	Ile	Asn	Ala	
	60				65				70				75			
att	tct	goc	aac	atg	gac	tcc	ttt	tca	agt	agc	agg	aca	goc	aca	ctt	410
Ile	Ser	Ala	Asn	Met	Asp	Ser	Phe	Ser	Ser	Ser	Arg	Thr	Ala	Thr	Leu	
			80						85				90			
aag	aag	cag	cca	agc	cac	atg	gag	gct	gct	cat	ttt	ggg	gac	ctg	ggc	458
Lys	Lys	Gln	Pro	Ser	His	Met	Glu	Ala	Ala	His	Phe	Gly	Asp	Leu	Gly	
		95					100					105				
aga	tct	tgt	ctg	gac	tac	cag	act	caa	gag	acc	aaa	tca	agc	ctt	tct	506
Arg	Ser	Cys	Leu	Asp	Tyr	Gln	Thr	Gln	Glu	Thr	Lys	Ser	Ser	Leu	Ser	
	110					115						120				
aag	acc	ctt	gaa	caa	gtc	ttg	cac	gac	act	att	gtc	ctc	oct	tac	ttc	554
Lys	Thr	Leu	Glu	Gln	Val	Leu	His	Asp	Thr	Ile	Val	Leu	Pro	Tyr	Phe	
	125				130					135						
att	caa	ttc	atg	gaa	ctt	cgg	cga	atg	gag	cat	ttg	gtg	aaa	ttt	tgg	602
Ile	Gln	Phe	Met	Glu	Leu	Arg	Arg	Met	Glu	His	Leu	Val	Lys	Phe	Trp	
	140				145				150				155			
tta	gag	gct	gaa	agt	ttt	cat	tca	aca	aot	tgg	tgg	cga	ata	aga	gca	650
Leu	Glu	Ala	Glu	Ser	Phe	His	Ser	Thr	Thr	Trp	Ser	Arg	Ile	Arg	Ala	
			160					165				170				
cac	agt	cta	aac	aca	atg	aag	cag	agc	tca	ctg	gct	gag	oct	gtc	tct	698
His	Ser	Leu	Asn	Thr	Met	Lys	Gln	Ser	Ser	Leu	Ala	Glu	Pro	Val	Ser	
		175					180					185				
cca	tct	aaa	aag	cat	gaa	act	aca	gcg	tct	ttt	tta	act	gat	tct	ctt	746
Pro	Ser	Lys	Lys	His	Glu	Thr	Thr	Ala	Ser	Phe	Leu	Thr	Asp	Ser	Leu	
		190					195					200				
gat	aag	aga	ttg	gag	gat	tct	ggc	tca	gca	cag	ttg	ttt	atg	act	cat	794
Asp	Lys	Arg	Leu	Glu	Asp	Ser	Gly	Ser	Ala	Gln	Leu	Phe	Met	Thr	His	
	205				210						215					
tca	gaa	gga	att	gac	ctg	aat	aat	aga	aot	aac	agc	act	cag	aat	cac	842
Ser	Glu	Gly	Ile	Asp	Leu	Asn	Asn	Arg	Thr	Asn	Ser	Thr	Gln	Asn	His	
	220			225					230				235			
ttg	ctg	ctt	tcc	cag	gaa	tgt	gac	agt	goc	cat	tct	ctc	cgt	ctt	gaa	890
Leu	Leu	Leu	Ser	Gln	Glu	Cys	Asp	Ser	Ala	His	Ser	Leu	Arg	Leu	Glu	
			240					245					250			
atg	goc	aga	gca	gga	act	cac	caa	gtt	tcc	atg	gaa	acc	caa	gaa	tct	938
Met	Ala	Arg	Ala	Gly	Thr	His	Gln	Val	Ser	Met	Glu	Thr	Gln	Glu	Ser	
	255						260					265				
tcc	tct	aca	ctt	aca	gta	goc	agt	aga	aat	agt	ccc	gct	tct	cca	cta	986
Ser	Ser	Thr	Leu	Thr	Val	Ala	Ser	Arg	Asn	Ser	Pro	Ala	Ser	Pro	Leu	
		270				275						280				
aaa	gaa	ttg	tca	gga	aaa	cta	atg	aaa	agt	ata	gaa	caa	gat	gca	gtg	1034
Lys	Glu	Leu	Ser	Gly	Lys	Leu	Met	Lys	Ser	Ile	Glu	Gln	Asp	Ala	Val	
	285					290					295					
aat	act	ttt	acc	aaa	tat	ata	tct	cca	gat	gct	gct	aaa	cca	ata	cca	1082
Asn	Thr	Phe	Thr	Lys	Tyr	Ile	Ser	Pro	Asp	Ala	Ala	Lys	Pro	Ile	Pro	
	300				305				310				315			
att	aca	gaa	gca	atg	aga	aat	gac	atc	ata	gca	agg	att	tgt	gga	gaa	1130
Ile	Thr	Glu	Ala	Met	Arg	Asn	Asp	Ile	Ile	Ala	Arg	Ile	Cys	Gly	Glu	
			320				325						330			
gat	gga	cag	gtg	gat	ccc	aac	tgt	ttc	gtt	ttg	gca	cag	tcc	ata	gtc	1178

-continued

Asp Gly Gln Val Asp Pro Asn Cys Phe Val Leu Ala Gln Ser Ile Val	
335 340 345	
ttt agt gca atg gag caa gag cac ttt agt gag ttt ctg cga agt cac	1226
Phe Ser Ala Met Glu Gln Glu His Phe Ser Glu Phe Leu Arg Ser His	
350 355 360	
cat ttc tgt aaa tac cag att gaa gtg ctg acc agt gga act gtt tac	1274
His Phe Cys Lys Tyr Gln Ile Glu Val Leu Thr Ser Gly Thr Val Tyr	
365 370 375	
ctg gct gac att ctg ttc tgt gag tca gcc ctg ttt tat ttc tct gag	1322
Leu Ala Asp Ile Leu Phe Cys Glu Ser Ala Leu Phe Tyr Phe Ser Glu	
380 385 390 395	
tac atg gaa aaa gag gat gca gtg aat atc tta caa ttc tgg ttg gca	1370
Tyr Met Glu Lys Glu Asp Ala Val Asn Ile Leu Gln Phe Trp Leu Ala	
400 405 410	
gca gat aac ttc cag tct cag ctt gct gcc aaa aag ggg caa tat gat	1418
Ala Asp Asn Phe Gln Ser Gln Leu Ala Ala Lys Lys Gly Gln Tyr Asp	
415 420 425	
gga cag gag gca cag aat gat gcc atg att tta tat gac aag tac ttc	1466
Gly Gln Glu Ala Gln Asn Asp Ala Met Ile Leu Tyr Asp Lys Tyr Phe	
430 435 440	
tcc ctg caa gcc aca cat cct ctt gga ttt gat gat gtt gta cga tta	1514
Ser Leu Gln Ala Thr His Pro Leu Gly Phe Asp Asp Val Val Arg Leu	
445 450 455	
gaa att gaa tcc aat atc tgc agg gaa ggt ggg caa ctg ccc aac tgt	1562
Glu Ile Glu Ser Asn Ile Cys Arg Glu Gly Gly Pro Leu Pro Asn Cys	
460 465 470 475	
ttc aca act caa tta cgt cag gcc tgg aca acc atg gag aag gtc ttt	1610
Phe Thr Thr Pro Leu Arg Gln Ala Trp Thr Thr Met Glu Lys Val Phe	
480 485 490	
ttg cct ggc ttt ctg tcc agc aat ctt tat tat aaa tat ttg aat gat	1658
Leu Pro Gly Phe Leu Ser Ser Asn Leu Tyr Tyr Lys Tyr Leu Asn Asp	
495 500 505	
ctc atc cat tcg gtt cga gga gat gaa ttt ctg gcc ggg aac gtg tcg	1706
Leu Ile His Ser Val Arg Gly Asp Glu Phe Leu Gly Gly Asn Val Ser	
510 515 520	
cag act gct cct gcc tct gtt gcc cct cct gat gag tct cac caa ggg	1754
Pro Thr Ala Pro Gly Ser Val Gly Pro Pro Asp Glu Ser His Pro Gly	
525 530 535	
agt tct gac agc tct gcg tct cag tcc agt gtg aca aaa gcc agt att	1802
Ser Ser Asp Ser Ser Ala Ser Gln Ser Ser Val Lys Lys Ala Ser Ile	
540 545 550 555	
aaa ata ctg aaa aat ttt gat gaa gcg ata att gtg gat gcg gca agt	1850
Lys Ile Leu Lys Asn Phe Asp Glu Ala Ile Ile Val Asp Ala Ala Ser	
560 565 570	
ctg gat caa gaa tct tta tat caa cgg aca tat gcc ggg aag atg aca	1898
Leu Asp Pro Glu Ser Leu Tyr Gln Arg Thr Tyr Ala Gly Lys Met Thr	
575 580 585	
ttt gga aga gtg agt gac ttg ggg caa ttc atc cgg gaa tct gag cct	1946
Phe Gly Arg Val Ser Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro	
590 595 600	
gaa cct gat gta agg aaa tca aaa gga tcc atg ttc tca caa gct atg	1994
Glu Pro Asp Val Arg Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met	
605 610 615	
aag aaa tgg gtg caa gga aat act gat gag gcc cag gaa gag cta gct	2042
Lys Lys Trp Val Gln Gly Asn Thr Asp Glu Ala Gln Glu Glu Leu Ala	
620 625 630 635	
tgg aag att gct aaa atg ata gtc agt gac gtt atg cag cag gct cag	2090

-continued

Trp Lys Ile Ala Lys Met Ile Val Ser Asp Val Met Gln Gln Ala Gln
640 645 650

tat gat caa ccg tta gag aaa tct aca aag tta tga ctcaaaactt 2136
Tyr Asp Gln Pro Leu Glu Lys Ser Thr Lys Leu *
655 660

gagataaaagg aaatctgctt gtgaaaaata agagaacttt ttcccttggt ttggattctt 2196
caacacagcc aatgaaaaa gcactatatt totgatctgt cactgttggt tccagggaga 2256
gaatggggag acaatcctag gacttcaccc ctaatgcagt tacctgtagg gcataattgg 2316
atggcacatg atgtttcaca cagtgaaggag tctttaaagg ttaccaa 2363

<210> SEQ ID NO 34
<211> LENGTH: 662
<212> TYPE: PRT
<213> ORGANISM: Homo Sapien

<400> SEQUENCE: 34

Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser Pro Arg Thr Leu Arg
1 5 10 15

Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg Arg Lys Val Lys Gly
20 25 30

Lys Glu Gln Glu Lys Thr Ser Asp Val Lys Ser Ile Lys Ala Ser Ile
35 40 45

Ser Val His Ser Pro Gln Lys Ser Thr Lys Asn His Ala Leu Leu Glu
50 55 60

Ala Ala Gly Pro Ser His Val Ala Ile Asn Ala Ile Ser Ala Asn Met
65 70 75 80

Asp Ser Phe Ser Ser Ser Arg Thr Ala Thr Leu Lys Lys Gln Pro Ser
85 90 95

His Met Glu Ala Ala His Phe Gly Asp Leu Gly Arg Ser Cys Leu Asp
100 105 110

Tyr Gln Thr Gln Glu Thr Lys Ser Leu Ser Lys Thr Leu Glu Gln
115 120 125

Val Leu His Asp Thr Ile Val Leu Pro Tyr Phe Ile Gln Phe Met Glu
130 135 140

Leu Arg Arg Met Glu His Leu Val Lys Phe Trp Leu Glu Ala Glu Ser
145 150 155 160

Phe His Ser Thr Thr Trp Ser Arg Ile Arg Ala His Ser Leu Asn Thr
165 170 175

Met Lys Gln Ser Ser Leu Ala Glu Pro Val Ser Pro Ser Lys Lys His
180 185 190

Glu Thr Thr Ala Ser Phe Leu Thr Asp Ser Leu Asp Lys Arg Leu Glu
195 200 205

Asp Ser Gly Ser Ala Gln Leu Phe Met Thr His Ser Glu Gly Ile Asp
210 215 220

Leu Asn Asn Arg Thr Asn Ser Thr Gln Asn His Leu Leu Leu Ser Gln
225 230 235 240

Glu Cys Asp Ser Ala His Ser Leu Arg Leu Glu Met Ala Arg Ala Gly
245 250 255

Thr His Gln Val Ser Met Glu Thr Gln Glu Ser Ser Ser Thr Leu Thr
260 265 270

Val Ala Ser Arg Asn Ser Pro Ala Ser Pro Leu Lys Glu Leu Ser Gly
275 280 285

-continued

Lys Leu Met Lys Ser Ile Glu Gln Asp Ala Val Asn Thr Phe Thr Lys
 290 295 300
 Tyr Ile Ser Pro Asp Ala Ala Lys Pro Ile Pro Ile Thr Glu Ala Met
 305 310 315 320
 Arg Asn Asp Ile Ile Ala Arg Ile Cys Gly Glu Asp Gly Gln Val Asp
 325 330 335
 Pro Asn Cys Phe Val Leu Ala Gln Ser Ile Val Phe Ser Ala Met Glu
 340 345 350
 Gln Glu His Phe Ser Glu Phe Leu Arg Ser His His Phe Cys Lys Tyr
 355 360 365
 Gln Ile Glu Val Leu Thr Ser Gly Thr Val Tyr Leu Ala Asp Ile Leu
 370 375 380
 Phe Cys Glu Ser Ala Leu Phe Tyr Phe Ser Glu Tyr Met Glu Lys Glu
 385 390 395 400
 Asp Ala Val Asn Ile Leu Gln Phe Trp Leu Ala Ala Asp Asn Phe Gln
 405 410 415
 Ser Gln Leu Ala Ala Lys Lys Gly Gln Tyr Asp Gly Gln Glu Ala Gln
 420 425 430
 Asn Asp Ala Met Ile Leu Tyr Asp Lys Tyr Phe Ser Leu Gln Ala Thr
 435 440 445
 His Pro Leu Gly Phe Asp Asp Val Val Arg Leu Glu Ile Glu Ser Asn
 450 455 460
 Ile Cys Arg Glu Gly Gly Pro Leu Pro Asn Cys Phe Thr Thr Pro Leu
 465 470 475 480
 Arg Gln Ala Trp Thr Thr Met Glu Lys Val Phe Leu Pro Gly Phe Leu
 485 490 495
 Ser Ser Asn Leu Tyr Tyr Lys Tyr Leu Asn Asp Leu Ile His Ser Val
 500 505 510
 Arg Gly Asp Glu Phe Leu Gly Gly Asn Val Ser Pro Thr Ala Pro Gly
 515 520 525
 Ser Val Gly Pro Pro Asp Glu Ser His Pro Gly Ser Ser Asp Ser Ser
 530 535 540
 Ala Ser Gln Ser Ser Val Lys Lys Ala Ser Ile Lys Ile Leu Lys Asn
 545 550 555 560
 Phe Asp Glu Ala Ile Ile Val Asp Ala Ala Ser Leu Asp Pro Glu Ser
 565 570 575
 Leu Tyr Gln Arg Thr Tyr Ala Gly Lys Met Thr Phe Gly Arg Val Ser
 580 585 590
 Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro Glu Pro Asp Val Arg
 595 600 605
 Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met Lys Lys Trp Val Gln
 610 615 620
 Gly Asn Thr Asp Glu Ala Gln Glu Glu Leu Ala Trp Lys Ile Ala Lys
 625 630 635 640
 Met Ile Val Ser Asp Val Met Gln Gln Ala Gln Tyr Asp Gln Pro Leu
 645 650 655
 Glu Lys Ser Thr Lys Leu
 660

<210> SEQ ID NO 35

<211> LENGTH: 162025

-continued

```

<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<300> PUBLICATION INFORMATION:
<308> DATABASE ACCESSION NUMBER: GenBank AC005730
<309> DATABASE ENTRY DATE: 1998-10-22

<400> SEQUENCE: 35

gaattcctat ttcaaaagaa acaaatgggc caagtatggt ggctcatacc tgtaatccca    60
gcactttggg aggcagaggt gagtgggtca cttgaggtca ggagtccag gccagtcctgg    120
ccacatggt gaacacactgt ctctactaaa aatacctaaa ttgacggggc gtggtggcgg    180
gcacctgtaa tccacagctac tcaggaggct gaggcaggag aettgcttga accctggaga    240
tggagggtgc agtgagccga gatcgcgcca ctgctctcca gccctgggtgg cagagtgaga    300
ctctgtctca aaaagaaaaa aagaaataaa tgaaacaatt ttgttcacat atatttcaca    360
aatttgaaat gttaaaggta ttatggtcac tgatatcctg ttctattctt tatataatca    420
ttaagtttga aatgtatact tgcactacta acacagtagt taatcttagt cctacaagtt    480
actgctttta cacaaatata ttoglaata tglatgcact ggtgtttatg taactgttta    540
tgtttatact tgttaaaatt agcagtttcc atctttttct attttgtacc atcacatcag    600
ttcagaagga ttgacagagc aanaatgatt gatgaagtat aanaatcaca tggtgagtg    660
cataaataca actctgaaca attaggaggc tcactattga ctggaactaa actgcaagcc    720
agaaagacac atatctata tgtcaagaga tgtaaccacc aggcagttaa agaaaggaag    780
tacacataga aagcacaaag gtgaataatt aaaaaattgg aatttatcag acactggatt    840
catttgctcc taaagtcaga gtctctcatt gtttttttgt ttttggtggg ttctttttta    900
atttttttat tttttgtaga gtccgagtc cactgtgtta cccgggctgg tctagaactc    960
ctggcctcaa acaaacctcc tgcctcagct tcccaaagca ttgggattac agacatgagc    1020
cactgagccc agcccagacg ctttagcatt tatgaagctt ctgaatatgt tgtagaagcc    1080
gcataagctt tccatgtcac ttcaaaagtt tgatggtctc tttagtaaac caaccaagtt    1140
attcctcaag ggcaaaataa catttctcag tgcaaaaacty atgcacttca ttaccaaaag    1200
gaaagaccca caactataga ggctgacttg aaagctgcac tcttcagagg ccaaaaaaaa    1260
aggtcccaac cactactaat ggaacattct ttagaagcgc cccaaagtta atgataaaca    1320
ttttcataca agagaaaaa gaacaaagtg ttagaacatt cctctatcaa ataaccctaa    1380
acatcaagga acatcaaatg catgccatgt ggaagaggaa gtgctagctc atgtacaaac    1440
cagtagataa tttcaacttg ctgccgaatg aaacctcttt gcaaggtagt aatcagcact    1500
tctcatgttt gttttgcttt gttttgtttt gtttttagag acaggccctt gctctgtcac    1560
acaggcttga gtgcagtggc acgatcagag ctcaatgcaa cctgaaactc ctgggctcaa    1620
gggatctccc tgccttagcc tcccaagtag ctgggactac aggccacca tgccagcta    1680
attttttaaa tttctatag agatgggata tcaatagcac ctttcatggt tgatgttcct    1740
alacaacgac caaggtacaa lgtggaaaag ggtctcaggg alctaaagtg aaggaggacc    1800
agaaagaaaa ggggttgcta catagagtag aagaagttgc acttcatgcc agtctacaa    1860
actgtgtttt tcttcagagc agagttgatg atctaaatca ggggtcccca accccagtt    1920
catagcctgt taggaacccg gccacacagc aggaagtgag caataggcaa gcgagcatta    1980
ccacctgggc ttcacctccc gtacagtcag tgatgtcatt agattctcat aggaaccatga    2040

```

-continued

accotattgt gaactgagca tgcaagggat gtaggttttc cgtctttat gagactctaa	2100
tgccggaaga tctgtcaclg tcttccatca cctcgagatg ggaacatcta gttgcaggaa	2160
aacaaacctca gggctcccat tgattctata ttacagtgag ttgtatcatt attctattct	2220
atattacaat gtaataataa tagaataaaa ggcacaaatag gccaggcggtg gtggctcaca	2280
cctgtaatcc cagcacttgc ggaggccaag gcaggcggtat cagcaggtoa ggagatcgag	2340
accatcctgg ctaaaacggt gaaaccccg tctactaaaaa ttcaaaaaaa aattagccgg	2400
gtgtggtggt gggcactgt agtccagct actcgagagg ctgaggcagg agaatggtgt	2460
gaacctggga ggcagagctt gaggtaaagc gagatcacgc cactgcactc cagcctgggc	2520
gacagagcga tactctgtct caaaaaaaaa aaaaaaaaaa aaagaataaa agtgaacaat	2580
aaatgtaatg tggctgaatc attccaaaac aatccccca cccagttca cggaaaaatt	2640
ctcccacaaa accagtcctt ggtgccaaaa aggttgggga cgcctaactc aaataactca	2700
atcttcatto aatgctaaaa aatgaataaa ctttttttta aatacacggt ctcactttgt	2760
gtcccaggct ggaaglaaggt ggcattgaca cagctcacg tagcctcaat caccacggcc	2820
ccaggcatcc tcccacctaa acttctgag tagctgggac tacaggcacg caccacctg	2880
ccagctaat ttttaaat tttatagaga tgggggtctc accatgttg ccagactggt	2940
ctcaaacctt gggctcaagt gatcctcct caaacctctg gaactcaagt atcctccttc	3000
cttggcctcc caaagtctg ggaattacaag catgagccac tgtaccagc tggataaaca	3060
ttttaaglcg cactacagtc atggacaato aggcctttca acatgcagta tggacagtga	3120
gtcccagggt ctgcttttcc ataactgaat acatgtgata ctaaggagaa aggtgctgc	3180
aaggatattt aanaatgaaga atatttaaaa tagaggaaaa actgtttctt catgactttg	3240
ataaggctga taaagacat ttctgtgac tcagggtgatt cactcaagta gtatattca	3300
gtaatcatta tctggaacag cctgaatctt aacaaaaata ccatgatttt ttaatgctgt	3360
tatgatacct tgatgatatg accaaactgc aatgtaggca gctaatctc cagagtttg	3420
acttccocga gagttgacag ttttcttcac aaattaaaga aatatatttt ttgatacatg	3480
attggcatat ttaaaaacta cactgaactg ctgcasaatg atataaagaa acattttcca	3540
gaatcaaatg caatcaaaag gtggattagg aatctactca ccattatcaa ctataagaa	3600
acacttgagc tgggtgtggt ggtccacatc tgtaatctca gcaacttggt aggcacaagg	3660
aggtggttg cttgaggcca ggaagctcag accagcctga gcaacatagc aaaaactcgt	3720
ctctacaaaa aaaaaaaaaa attaacagg catgggtggca gatgcttgta atccagcta	3780
ctctggaagc tgaagtagga ggaactgctt agcccaggag atcaagactg cagttagccg	3840
tggtoatgct ggcgcacagc ctgagtgaca gagagagacc ctgtctcaaa aacaaaaaca	3900
aaacaaaaac acttaacctt cctgtttttt gctgttggtt ttgttggttg tttgttttga	3960
gctggagtct cactctgttg ccaggtctgg agtgcaagtgg cgtgatcttg gctcactgca	4020
agctctgcct cccgggttca cgcattctc ctgcctcagc clcccagta gctgggacta	4080
taggcgcccg ccaccacgac cggctacttt tttgcatatt tagtagagat ggggtttcac	4140
cgtgttagcc aggatgggtc tgatctcttg acctgtgat caacctgct cggcctccca	4200
aagtgtctgg attacaggca tgagccaccg caccgggcca accttctgt tttttagttt	4260
gatatgcttg ttaactcagc agctgaaaga atgctgaaag tggccttcag taaaaaaaa	4320

-continued

tcaatagaat	ctctacatcc	atatattaac	tgaatgcata	tccagattga	tcagttagag	4380
caaaaacac	calcatcalt	cctgatgacc	tclaatcttg	glltcggctt	tcatttcaa	4440
tggaacaga	ataaggaaa	aaatggaaag	gctctggaaa	tttgtcctgg	gctatagata	4500
ctatcaaga	tcccacaca	taagatctct	cctataata	taaaacaa	ataatataat	4560
ttttaattat	ttttttctct	tcagaggatt	ttatttcaag	ataaaacata	acttctacco	4620
atactattga	ttccaaagg	tagaaaaagt	gtttttccct	atcttatcct	tcaaagaggt	4680
cacagcaat	caaacatcta	taaaatgcct	ctgcataatt	gtcagaagct	atagtccaga	4740
aatcattgaa	aatgcttttc	cattttaaag	ttagggtgagg	tgtcttagga	aacctctatg	4800
acaacttact	ctattttatt	ggaggtaaac	tcccagactc	tcccagggtc	tcctgtattg	4860
atctcatttt	ttaggcttcc	taatcccttg	aagcacaa	gaaaaagccc	tggatctctt	4920
ttctgcacat	atcatcgcg	aattcattcg	gcttccagca	agctgacact	ccatgataca	4980
agcggtctcg	ccctctctcg	gaagccagtc	cttgctgcgg	ttagcttagga	tgaggggttt	5040
ctggtgcttc	agtcgaggct	tctgcgggtt	cccaagccgc	accaggtggc	ctcacaggct	5100
ggatgtccac	attgcacact	gagctccttg	caggctgtac	caatttttta	attatttaatt	5160
atttattttt	aaaattatgg	tgaatatttt	ggtattctgc	tctaaaatag	gcccataaatt	5220
gcacagcaga	tatctcttgg	aaacccacag	tttccactgg	aagaactaag	tatttttctt	5280
ttaaagatgc	tactaagtct	ctgaaaagtc	cagatcctct	acctctttcc	atcccaact	5340
aagacttgga	alttatgaga	gatctagcta	acagaaatcc	cagacacata	attggttctt	5400
cccagagtgc	agtcctccta	aagaggctca	gcccctaagca	ggcccttgca	ccaggaggggt	5460
gggtctgaga	cccacatagc	acttcccna	gtgcatgctc	cagagaggca	ctgaacacgc	5520
tgagcacaa	cctgcaagcc	tggagaactc	tcacagtcag	aacggagggg	gccagtgagg	5580
actaaacata	agagaaaagg	gaacacagag	aaatggatgg	caccaacaac	cagcaaaagc	5640
ttcatggcca	atgaaagcat	cagtgacggg	gccagaaccc	tcatcccaaa	agactcttca	5700
ctgcctttag	tgaaaaaaca	tggctagaga	gtgaagttaa	gatcatgtat	agagaggtaa	5760
agttacattt	ttatattctg	actctgctaa	tgtgaatttc	cctatctgct	agactaaaag	5820
tttccagcac	cctgttccaa	tatcccatla	gttgctagag	acttaaatg	aacagaaagc	5880
acattgtcag	gatgactatt	acaaaaaat	caaaagacag	caagtattgg	tgaggtatga	5940
gagaaactcg	aacttttttg	cactgtttat	gagaatgtaa	aatggagcag	ctgctgtgga	6000
aaagagtatg	cagggttcctc	aaagagttaa	accaagatgt	ggaacaact	aaatgcccac	6060
cagtggatga	aggggttagac	aatatgtggt	atatacatat	catggagtac	tattcagcct	6120
ctaaaaaaa	aaagggaatt	tctataacat	gcaaaagcat	ggaigaatct	tgaggacatt	6180
ttgctaatga	aataaggcag	tcatagaag	acaaatactg	cacgaactcca	cttatatagag	6240
atcccaaaa	tagcaaaatt	catagaatca	aagagtacaa	tggaggttac	ctggagctgc	6300
agggcgggaa	acgaggagtl	actaatcaac	gaacataaac	ttgcagttaa	gtaagatgaa	6360
taagctctca	agatcagctg	tacaacactg	tacctaagat	caacaataat	gtattgtaca	6420
cttaaaaatt	tgttaagggt	agattaacaa	atgtagttaga	tcccaaatg	tggttaatgt	6480
ttcttaccac	agtaaaataa	aaaaagaata	tcaagccacg	gagttcgaga	ctagcctggg	6540
taacatggtg	aaacccgtgc	tctacagaaa	atacaaaaat	tagccagctg	tggaggtgca	6600

-continued

ctcctagggga	ggctgagggtg	ggaggcttgc	ttgagcccg	gaggtcaagg	ctgcagtgag	6660
ccatgattgc	accactgtac	lccagcccg	atgacagagc	aagacaccac	ccccccaaa	6720
aaagaaaaa	gaatatcaaa	cattttaaaa	gatcagatgc	gcaagaacaa	caacaaaaa	6780
gagatgaaca	gagcatcgac	cctcatctag	tgggattctt	ggtctaacctg	aaaaacagac	6840
attgagagac	aaacaatgac	agtgatgtga	tcacagcaat	tacacaggta	tcccctgggg	6900
actgcagaag	aaaggaggaa	tgcctaactt	tcagaaaata	gagaagcgt	caaacagttg	6960
gtgaagcct	tcnaaaacta	gagagaactg	cacaccccaa	atcacagaaa	gaagaaagc	7020
cgtggggagat	tctggggaccc	accggctatt	tttgatggct	gaacaccctg	ctgcaggaga	7080
gacaggagct	ggaagcatg	gtgggatgaa	acctcaaaac	gctttgectg	cattgcttaa	7140
gatgactggg	cttgattaac	tctagtcaat	ggggacaatt	caatcaaaag	agaaagatgc	7200
tcaattccac	attttagaat	gattttttat	ggcagtatgg	ggaatagatt	aaaagagagt	7260
gaagctggag	gcaagaagct	tgttaagagg	gaactgaaa	agcttagatg	ataaataata	7320
aactgacaga	gtgactagaa	aaalcaagaa	aggctgaac	aacagatacc	tagatgaaaa	7380
taacaggact	tgtaccaccg	ttgtatcttg	gagaggaaag	agttgtttcc	ttgctttccc	7440
tacgaatggg	aatacggga	gtttgcctg	tgtattgggt	atatactggt	gtgtagccaa	7500
tcactgacaa	ccatttagca	gcttaaaaca	caaaggctta	tctccagtt	tctgtggggc	7560
aggaatctaa	gataggctta	gctggctggt	tctggctcag	agttctcaa	gaggttgcaa	7620
tcaagatglo	agclgggggt	gcacatctg	aaggctcaac	tggggccgga	gggtccactt	7680
ccaaggagtt	cactcaactg	cctgacaagg	cagtgctggt	tgttgccagg	agatctcaat	7740
tcattgccaa	gtgagcctct	ctatagcatt	gctggaaacat	cctccccatc	tggcagttgg	7800
cttctctcag	catgagtgat	ctgagagaga	gagcaaggag	gaagccacag	tgttcttcc	7860
actcctactc	ctaaccctat	ggacctactc	ctaaccctct	cactctctgc	ttattccatt	7920
agltagaag	ggaactaagc	tccactctt	gaataaagaa	gtgtcaaaag	atttgtggat	7980
atatttaaaa	atcatcacac	tgtggaagtg	gatagggggt	toaattaatg	ctgaacttga	8040
aatgcctgag	accattcaat	gtccaccagg	caatgaacat	accatagat	ggtcatgact	8100
ttagcaagaa	tagaggaaag	tcacagaatt	aaggaggaa	tgaaggtaa	aagaagtgg	8160
gtcagattcc	ccctgaaaag	tgagccatga	aaggaaactt	aactattgag	ttagaggtca	8220
gagtaggaaa	ttctcggtgga	attctttttt	aaagaaagga	accatataag	catgttttga	8280
ggtagaggga	gaataaatca	gtagacaggg	agaggtaaaa	aacataaatg	ataggggata	8340
gttgacaaa	gtcttggcag	aatcccttac	ccattgactt	ggggccaaag	gagggaacat	8400
tctttgtttg	agggataagg	aaaataagaa	agaatgggtg	ctatttagtg	tggtoctgtc	8460
tctagggcaa	acgcataagg	aacaaactgt	gtgtgttagg	aatatagatg	tgaacctaca	8520
ttgagattct	caactcaaat	ccatttttgt	gttaacctga	ccttccctacc	ttctcttttt	8580
gtacatgca	gactgclgtt	ttgtcttctt	ggcctgtlcc	aggttlccagc	attctggcat	8640
atctgctacc	ctgttcccaa	acctctctag	agtcctatgt	ccttcccttg	atagtgtttg	8700
attggggca	gtatctaaag	agtgatgcct	tcagtttagg	ctgagaacct	cctctatgga	8760
aatctccatc	agtagacctg	acagacttgg	tactttggag	atgtcaactg	tcocagcctg	8820
tggcttagga	gaattccaag	ctgggcctct	agtagtatgg	ataaggcgtt	aaggatatct	8880

-continued

tgaaccagag	tctgtcatat	tctccaatgt	gggacagata	aaacagtggg	agtgtgtggg	8940
tttctgagcl	agaactctlgg	tttttgggtc	agattctctg	atgtatgacc	tttcagaggg	9000
attaaaaatt	gttctaatac	aatgtccaat	acaaatgtag	ttccttttct	gttagggcct	9060
caacnaaaac	tgacaaactg	tagatgaaca	ttaaaactatg	acaattccatg	gaatgaata	9120
cagtaatacc	tgcggttccc	ccattttagc	agtcactatg	gtgacatttg	gcacaaatgg	9180
ctatttaagg	gtgtctttgt	taaaacctac	catcttacta	ggcacatgat	attgaaacta	9240
atgaataaat	ggagaaactt	cttaaaaact	tttaattgaat	aaagtgatga	agtgataata	9300
ttttagctgc	tatttataaa	gtgactatta	cagggtcaaac	attctctctag	gggttttttg	9360
ttgaagttgt	cacatttaaat	cettaataac	ccactatgag	tcagggtatto	ttctctcccc	9420
tttggacagt	tggggaaaig	gggggtcagag	agggttaggta	atttgcctcag	ggccacacaa	9480
cctgcattga	gaaaacttga	gattttgaca	ggaaactgtat	aaactctgaa	gtccatgctt	9540
ctattttccc	atgtctgcctt	tctaataaaa	ggttaactaat	gtacttggat	gctgccccca	9600
aagtgagtc	cttccacccc	acctactctg	attttctcca	taaaactaat	caatccctga	9660
caacttattt	attgtctgac	tcccccaact	gattataaac	tcaataaaag	caagatcctt	9720
gtctgtgaa	tatcagtacc	taaaagctgt	tctagccacg	agcaagtaat	taatatattgt	9780
tgaatgaaca	aataaaggaa	aaaaattcaa	aggaagaaaa	agccctaaaa	cagatgttta	9840
cctaaccata	cattttaaaa	gaagcatat	aacaaattca	ggacagaatt	taaatattgat	9900
tttttaaga	aataaccaag	tgctagclgg	gcacaglggc	tcacacctgt	aatcctagca	9960
ctctgggagg	ccgaggccagg	cagatcactt	gaggtcaaga	gttcaagacc	agcctggcca	10020
acatggtgaa	acctgtctct	actaaaaata	cagaatttat	ccaggcatgg	tggcaggtcc	10080
ctgtaacccc	agctactcag	gaggctgagt	caggagaatt	gcttgaaccc	aggaggcaga	10140
ggttgcatgt	ggccaagatt	gcaccactgc	actccagcct	gagtaacaaa	gcaagactct	10200
gtctgaagga	gaagggaaga	aagaaggaaa	gaagggaaga	aggaagaag	gaagaagga	10260
aagaagaaga	gaagaagaaga	aagaagaaga	gaagaagaaga	aagaagaaga	gaagaagaaga	10320
aagaagaaga	aagaagaaga	gaagaagaaga	accaaagtgt	tatttgggac	ctactatgtc	10380
atgtttttcc	atgcacgcct	ttttcaagtaa	agcaagttagc	aaacttgcaa	gacataaaca	10440
acaaatattt	gtctctataa	ctctaaaaatt	gtgctttaag	aagttcctct	ttaccagctc	10500
atgtatgcct	tagttttcta	agagttacta	gtaacttttt	ccctggagaa	tatccacagc	10560
cagttttatt	aaacaaagga	ggatgtctac	taacatgaag	ttatcaaatg	tgaagcctaag	10620
ttgggccagt	tcattgttaat	atactccaga	acaaaaacca	tcctactgtc	ctctgacaaat	10680
tttacctgaa	aattcatitt	ccacattacc	aaggagccag	gglaggagaa	tatagaaaga	10740
ccaccacaaga	atccttactt	ctttcagcaa	aatcaattca	aagtaggtaa	ctaaacacat	10800
gccttaacaa	tgaatagcag	attgtgtcca	gaagaatgat	ctacaaacata	ttactgtgaa	10860
ggaactactg	aaatatttcca	ataagacttc	ctcccaaaat	gattttattg	aatltgcatt	10920
ttaaaaaata	ttttaagcct	aaattttaaa	aggtttgata	ttgggtacatg	aatagacaaa	10980
cagacatgga	ctagaccacag	aattaggttc	aaacatatata	aggaatttaa	tatcagataa	11040
atctagtatt	ccaaagggaac	caacaaatgg	tgttcagaca	gcaggatagg	catcaggaaa	11100
acacagttg	ggcacccctac	cttactccta	acacacaggag	taactgaagg	agcaccacaa	11160

-continued

atttattttat	tittaattata	gttttaagtt	ctaggggtacg	tgtgcacaa	atgcagggtt	11220
altacatagg	tatacatlgt	ccatglgtgt	gaggagcacc	aaatatttaa	aagaaaaaaa	11280
ttggccaggg	gggtgggtct	acacctgtaa	tccagcact	ttgggaggcc	aagggtggca	11340
gatacactga	ggtcgggagt	tcgagaccag	cctgagcaac	atggagaaac	cccatctcta	11400
ctaaaaat	aaaattagcc	aggoatgggt	gcacatgcct	gtaatcccag	ctacttggga	11460
ggctgaggca	ggagaatagc	tttaactctg	gaggcacagg	ttgcggtgag	ctgagatatt	11520
gcactccagc	ctgggcaaca	agagcaaaac	ttcaactcaa	aaaaattaat	aaataaataa	11580
aaataaagaa	agaaaaagaa	aaaatgaana	tagtataatt	agcagaagaa	aacaccgtag	11640
aatccctcga	ctcttaggat	ggggaatgcc	tataatataa	aaacccctgaa	gttataaaa	11700
agaaaatcac	ctacatacaa	accaaatctt	tctaatgcgc	taaaacatag	cacaaacaca	11760
gctaaataat	catagctgaa	tgaactggga	aaacaaaact	tgactcatat	ccagacagag	11820
ttaattttcc	tacacataaa	gagtacatat	ataaacccaa	caaaaaaac	accactaac	11880
caaaaataaa	atgtgacagg	taalgaacag	glagttcaca	gagaatacaa	atggctcttc	11940
ggacataaag	atgctcagac	tgacttttac	ttattttatt	tttgagagac	agggctctac	12000
gatgttgccc	aggttttagct	caaaactcctg	ggctcaaatg	atagtaccag	gaactacaggt	12060
gtgccccacc	gcacctgggt	cctcaaccac	ctgtattaac	aggaaatgca	aaataaaaact	12120
ttcaaatcta	ttttacctat	tagaatggca	aaaatttgaa	aaacttcaaa	catcatcatg	12180
llggtgagaa	tgtgaggaga	ctggcactcl	cattttttgc	tgatagcala	tatalactga	12240
ttggtctctat	ggaaagcaat	ctggcagcgt	ctataaaatg	tacaagtga	tatatccttt	12300
gacaaagcaa	ttccactcta	ggaatgtgtt	ctatatgtgtt	gtgtctctcg	gggtcgggaa	12360
ctgggagcta	agggacaggg	gcagaagata	atcttctttt	ccctctctcc	ccgttaaaaa	12420
tgttgaattt	tatatactgt	aatatattat	ttttcaaaaa	agataatttt	taagcgatat	12480
gtctgggaat	tttttttttt	cttttctgag	acaggggtct	actctgtcat	ccaggcttga	12540
atgccatggt	atgatctcag	ctgactgcag	cctcgacctc	ctgggttcaa	gcaatcctcc	12600
caacctcagc	tctctgtagt	ctgggacctac	aggcacgtgc	catcatgcta	atttttgtat	12660
atacagggtc	tonctatggt	gcccaggcta	atgtcaaac	cctaggctca	agcaatccac	12720
ccacctcagg	ctccaaagt	ctgggattac	aggcgtgagc	caaccgcct	ggccctggga	12780
attcttcaaa	aagaaaaaat	atctactctc	ccctctctatt	aaagtcaaaa	caggaagga	12840
aatccaacct	ataattgaa	tagagaagg	cctcaaccct	gagcaacaaa	cacaaaggct	12900
attttctgaga	caggaaattt	ctgaacaaaa	tggagggaag	atgacaagaa	tcaagactca	12960
cttctcggct	gggcgcagtg	gtcacacac	glaatcccag	caatttggga	ggccgaggcg	13020
gacagatcac	gaggtcagga	gattgagacc	atactggcta	acacagtga	accagctctc	13080
tactaaaaat	acaaaaaatt	agccgggcgt	gggtggcaggt	gcctgtagtc	ccagctaact	13140
gggaagclga	ggcaggagaa	lggcglgaac	ccagggaagc	gagcltgac	tgagccgaga	13200
tcaagccact	gcactccagc	ctgggtgaca	gagcaagact	ctgtctcaaa	aaaaaaaaaa	13260
aagactcatt	tctctagatc	ttgagcgcta	ttcaaattta	tctcagctta	gtgagaggtt	13320
aaagcaagga	atatcctctc	ctgtggggcc	tgctccttac	tgaaggaagg	taacggatga	13380
gtcaaggaca	ccaattgaga	aaagcaacta	caccattatc	tgatgaacat	tacgtgaaga	13440

-continued

agggtaagaa	gtgaagtggg	attgctgaag	aagtoagtga	aagcggacat	tcatttgggg	13500
aaatggaata	taggaaatcc	ataaaagtga	tlaaaaagat	gttagaggcl	gaggcggggg	13560
gaccacaggg	tcaggagatc	gagaccatcc	tggtcaacac	ggtgaacccc	catctctact	13620
aaaantacaa	aaaattagcc	aggcgtgggtg	gacggccccc	gtagtcccaa	ctactcggga	13680
gactgaggca	ggagaatggc	atgaacctgg	gagacggagc	ttgcagtgag	cagagatcac	13740
gccactgcac	tcacgcctgg	gtgacagagt	gagactccat	ctcaaaaaaa	aaagttagat	13800
acgagagata	aagatccaac	agacacacaa	ctgctaatto	tgaacagaac	aaaacaaatg	13860
gcacaggaaa	agaaaaatta	agatataaca	cgggaanaact	ttcctgnaat	tgagtaactg	13920
aatctatagc	ttgaaagggt	ttagcatatg	ccaagaaaaa	tcagtagagt	ccaaccagca	13980
caagacacat	ctagcaaggg	tgggtgattct	accaacacag	agaaagaagt	gggtgaccca	14040
taatgcggaa	aaaggcagac	catctgcagt	cttctccaga	acactggagt	ctgaagacaa	14100
aagaatgctg	cctactgagc	cagaagggag	agaaagtga	ccaacacatc	tttaocaaat	14160
tagaatgca	cgattatttt	aaaggctgca	aaagccatga	agacatgaa	agaacacaa	14220
catttacac	atgaaagaac	acaagcattc	tcatactcaa	gaatccttaa	gaaaaatgta	14280
gtctaatcc	agcccaactga	aagttaaatg	tacttaattgt	gtctaatat	gggaacttca	14340
tagcttcaaa	tcagctctgg	cccatctacc	aacatctctc	gcccggtctt	cctgcaatag	14400
tcagcacctt	tcctctctcc	cagtcctgtc	ccctggagtc	tgctctcagc	atagcagagt	14460
gaccacatca	acaccccaagt	cagagccctc	cagtgccgac	tggtctacaa	agcccttccc	14520
accccccaac	ccacgtgccc	tcgggatcc	tgtagcgtgt	ctctgcata	ccctagcagc	14580
cctggcctcc	tcactgccc	tcctgtacat	caggaaaggcg	actccttgag	tcttggtctc	14640
ggcgcctcc	tcacactgca	gtgagttaac	tcctttacct	actctaggtc	attgctcaaa	14700
tgtaagcacc	tcattggggc	cctccctgac	tacctatttt	aaattctaca	tactcccttt	14760
gaccccatgg	acctcaactca	ccctattcca	cttttattct	tacaatttag	caattgtttc	14820
cttctaactg	attctaagac	ttactcaatt	attacattgt	ttgccacccc	ctctagtaca	14880
tacaactcag	aggggcaggg	atttctgtct	atttattcat	ttctttatcc	ctaggacata	14940
gaacggggcc	tagttcagag	tattcaatgt	tatcaatgaa	tgaactagca	gtagtacccg	15000
ttccagttag	gcacagaatt	aaatctaaat	agaattaaat	ctcatggctc	gggttaacta	15060
tgatagaaa	attagatata	atttttaagaa	gcctagaaag	aaaaaattaa	taattgaana	15120
ataatattaa	tttgataata	ataacaaaaa	ctctgccagg	cactgtggct	caaatctgca	15180
atcccagcta	ctcaggaggc	tgagggtgaa	ggatcaactg	agaccagagt	tcaagactca	15240
gcctaggcaa	cacggcaaga	aactgtctct	aaaaaaatta	aaacttaaat	ttttaaaaaa	15300
gaattctcaa	agcgtcacaa	aaactggaga	ttaaaggtaca	ggaagtgtga	agtaaatatta	15360
ctatgtcaat	gggttttttt	tttttttagaa	aggtataaac	aaaagatttc	tttctcaagt	15420
cgalaaactg	agaaagataa	gcatalcttc	caattaacag	agggggaggga	aaagccagal	15480
acaacaaaat	aagatataaa	ttagtttcca	gttgaaaaa	agagtaggag	ttattttgca	15540
tcacctcacc	tgtagacctc	cccagcccaa	aaaacactac	tgatanaacg	ggtagnaaag	15600
catactctca	gataaagcag	gaaaaactgc	cacagtctca	aaccacaaac	tataagcaca	15660
cacotggcca	acccctgcaa	gtctgggctc	agtaggagga	acgtgctgag	agctaggatg	15720

-continued

tacaaactta	gacattctgt	gggatacaga	tgtccctgga	agggtcacac	cattccaaa	15780
gcacctgtaa	tgcocactga	ttacagccac	catatgtgag	agagaaactc	agggcactta	15840
gagagtataa	caagaacctt	atgtcatctg	agatgaggaa	tcctcagccc	tgcaaatata	15900
ccaaactcttt	agaaacaactg	gcanaacata	aatatccaca	acttttgttt	cagtaattcc	15960
actcttagat	atcaatccaa	agtacatgag	acagcagata	cacacacaaa	atggtattta	16020
ctgcagcatt	gtttataata	gcaaaaaaca	agaaataatc	catatgtctc	aataggatac	16080
tgggtacatg	agggtagtga	cccatccttc	aacctccaaa	aagagtata	tggatgtcca	16140
cagatggaca	taaaaagctg	tgtgttacgt	gaacacaaac	tcaagcagca	gcaggatggg	16200
cttatgatag	tcatgtatgag	ctaattctctg	gaaaaaaaaa	tctagtgtgt	gcacagaaaa	16260
catctgaaag	aacagaaaaa	aaactatcag	cagaatatgt	agatgtttta	ctaagtgtga	16320
tatctatact	gcttgaata	tttaccocaa	gcaagaatta	ctttttggaa	aaagaaaatt	16380
caggaataaa	agcatttctt	taaacttcat	gtttasacaa	atggtgatgg	aataaaagag	16440
ttcttatcca	tcataaacac	acacagcaca	catgcaagca	tgtgcgtgag	caacaccttt	16500
acttgataaa	taccatgttg	aatattttag	tctttccttt	taggttctat	cccttcactc	16560
aaantgcggt	tataaataaa	tgtacttttc	atgtgccttc	tgcctaaacc	cactttaata	16620
taactttaca	gtcccattat	cattatagtc	tcaaaagctag	actcagcctg	aaactacctt	16680
ttcatttgga	acccttatta	aaatgccaca	tacagctcct	tcaaataaaa	acaaacccta	16740
ggacctgaca	ctaggcttcc	tttgttgcta	ctcataatgg	caaagttctg	tgcattataa	16800
acatctcttt	tcatttttatt	gtcacatato	caagggtttt	atatgttttt	cttatattat	16860
cttaantcca	aacaccatca	cgtctctttc	cagatgaaaa	taaggaaaaag	aaattgagca	16920
actgactgac	ttaaaggtoa	taaaactata	tagtagcaga	gtcagcaaaa	gaagaaacac	16980
acatctccca	agtagaggct	gaaaaccagt	accattcacc	tccagggtga	gctatatata	17040
gattacaaga	tcaccttctc	taaatgttca	aaetgaatcc	catacccata	ctttaccact	17100
acctcgtaag	aacagoccca	gatcttgta	tagccttttt	tttagcatgc	tgaagccaat	17160
aaaatgcttc	ccattcagca	agagaaacaa	gttttgaaac	actgaataat	ctgcccaggg	17220
ccatgaacca	tttccactgt	gagaaatgtt	ctccactgtg	tggagaagat	ccctactctt	17280
ctccacacag	gcagaacatt	agaaaaattc	ttggtattcta	tgatgcacag	cttaggagtc	17340
tgtttagcac	aatttaagtc	caaatagtta	ttaaatccctc	ctctgttcca	gaacagtgcc	17400
taaatactgt	gaatataaaa	attgaaaaga	tactctctctg	gctcccaaga	aagtcagcca	17460
gatagaggag	acacaggcac	acaaatcact	gtcacatgaa	gctctacctc	ccaaactcca	17520
aacgaggggc	taagtcacca	agaatacagt	agcagttgtg	actacagata	actactataa	17580
ttcaataact	tatctccctt	tagaaaaactc	ttctcccttg	gaattttatt	tgcatttcta	17640
aataccattc	cttactaaaa	ggaagcaggg	ctccttgggg	aaatagctga	ttctaggtgt	17700
ggactatgaa	atgaaaalgg	tgagtcctggg	acatcccatg	tlgcccagaa	atcaaggaac	17760
tgcccacaga	ttaacagagt	catgttaaat	ggacctaaga	gtgaaccaga	aggagctcac	17820
tttgccccgc	gtggaaacat	tccaagaaaa	acatgcacgt	aatgaattat	aaaaactgaa	17880
ttaaaataca	tattgtgtact	aaaaagagaa	caaaaggatg	tggctttgga	taaaactctt	17940
cttcattgaa	gaataccagc	taataaatgt	aaaggaaatg	agagaattag	aaaaattatc	18000

-continued

atatttgtataa	cottaatata	ttcacctaga	catgctaaaa	ccactgagta	aaagctgct	18060
tgggaagagg	algctcacat	gatctcagag	ttcacacca	cagataattt	attagalaca	18120
gggaaggaga	tgtgatcaag	cttctgtga	ccccagcca	ggccccaca	cactatgtgc	18180
ctcttgtga	tgtgggagct	acacagctc	gcccacacag	cttctcgcca	aaactgtttg	18240
aaagtaatac	caaggggaag	actggacagc	ttctgacct	gagacgctcc	accagacaa	18300
ttgcttgccc	tctccaaaga	aacttgcttg	gcctctccaa	agaaaaactc	gtttcattta	18360
aaacaaaaac	taattattta	aaaacaaacg	aaaagcaagt	tgtggagcttg	agctccaggg	18420
acagagcaga	catacttttc	cctgttcttc	ccagtaagtg	gtaataaaaa	ccctcaacac	18480
tagatataaa	acaaatataa	gaaggttctg	gaaggggaag	aggaggcaga	ctatccaggt	18540
goottgaggo	ccacagaaac	accagtgat	gggttcactg	ggtctctttt	ttgcttcaat	18600
atctcagact	tggagctgaa	gcagcaggca	acttcaaaac	accaaggggc	acagattgaa	18660
aagccccaa	aaaagctgc	ctctctctag	caagggacca	ggaaggagac	agtctaatga	18720
gatggaacac	atttagacag	taactgccc	tttaacagca	ataactgagc	aggagagcta	18780
gaactccagt	cttgtgagga	cgtaccaggg	taccacacac	ccccacaa	gctgagtaag	18840
gaactgcact	tttatccctg	catggcagta	gtaaggagcc	catacctcac	ccgcacagag	18900
tgtcagggga	acctggactt	ccactccac	ccaggagtga	tgaggccctc	ctgctgggg	18960
tcattgcaga	ggaggccctag	tggagattca	gtgacttaac	cttttccag	agataatgag	19020
gcccacttct	ctcccctctc	ccccalggtg	acagtgaag	cactgtggca	agcagtaggc	19080
actoctaccc	ctcctagcca	gggaggtatc	agggaggcca	agtagggaac	cagaataccc	19140
acaacccccc	agcagcaaca	ggggtcccc	accctattgg	gtgtcaatgg	aagcagagcg	19200
gaaagcctgg	atattttacc	ccatctagaa	gtaacaagct	gatgtcccc	ttcttctact	19260
acaatggtgt	tcaaaacagg	tttaataaag	gtctagagtc	tgataacgta	atacccaaat	19320
cgttgaggtt	ttcattgagg	atcatttata	ccaagagtc	ggaagatccc	aaactgaag	19380
agagaaaaa	caattgacag	acactagcac	taagagagca	cagatattag	aactacctga	19440
aaggatgtta	aagcacatat	cataagcttc	aaccggctgg	gcgcggtggc	tcacgctgt	19500
aaacccagca	ctttgggagg	ccgagggcag	tggatccaa	gatcaggaga	tcgagaccta	19560
ctctgctaac	accgtgaac	ccctctcta	ctaaaaatac	aaaaaaaaat	agcaaggcat	19620
gggtgtgggc	acctgtagtc	ccagctactc	gggagcctga	ggcaggagaa	tggcatgacc	19680
ctgggaagag	gagcagtgag	ccgagatcgc	accacccgac	tccagcctgg	gcaacagagc	19740
aagactctgt	ccccaaaaaa	aaaaaaaaaa	aaaaaaaaag	ctcaacaaac	aactacaaac	19800
glgcttgaaa	caaatgaaaa	aaaaalcttg	gcaagaaaa	aaaagatata	tattttggcc	19860
aggtgcagtg	gctcacagcc	tgtaatccct	gcactttggg	aggctgaggg	aggcggatca	19920
ccctgaggtca	ggagtttgag	accagcctga	ccacacatga	gaaacccctg	ctctactaaa	19980
aaacaaaaat	tagccagtoa	tgggtggaca	tgccigtlaal	ccagctactc	caggaggccg	20040
aggcaggaga	atcgcttgaa	ctcaggaggt	ggaggttgcg	gtgagccgag	atcccgccat	20100
tgcacattgc	actccagcct	gggcaaaaag	agcaaaaactc	catctcaaaa	aaatagatac	20160
atattttaat	ggaaatttta	gaattgaaaa	atacagtaac	caatttgaat	ggaaagacaa	20220
catagaatgg	agggggcaga	caaaataatc	agtgaacttc	aacagaaaat	aatagaaatt	20280

-continued

acccaatatg aagaacagaa agaaaataga ctggccaaaa aataaagaag aaaaaagagg	20340
agcagcagga ggaatgatgg aaaaagagaa aggaagggaag gaagggaagg agggagggaa	20400
ggagtggagg aaaaagtctc aaagacctct gagactaaaa taaaagatct aacctgtgtc	20460
atcaggggtc aggnaagaga caangatggc acagctggna acgtattcaa aanaataatg	20520
ctgaaaaact cccaaatttg gcaagagaca taacctata gattcgaaat gctgaacccc	20580
aaataaaaaa cccaataaaa tccacaccaa aatcacatcat agtcaaactt ctgaaaagac	20640
gaaagagaaa aacgtottga aagcagtggg tgaacaacaa cttcatgtat aagggnaaaa	20700
caattcaagt aacagatttc ttacagaaat taagggaagcc agaaggnaat gacacaatgg	20760
ttttcaagtg ctgaaaagaa agaagtgtca acacaaaatt ctagattcag taaaaatatc	20820
cttcaagaat caatgggaaa tcaagacagt ctacagataaa gcaaaaaaag agaatatgtt	20880
gccagcagat ctccccataa ggaatggcaa aaggaaagatc atgcaacaga ccaaaaaatg	20940
atgaaagaag gaatccagaa acatcaagaa gaaagaaata acatagtaag caaaaaatca	21000
tgtaatatca ataaaaattc tatctctct taagaattct aattatatt gatggttgaa	21060
gcanaaatta taacctgttc tgaagtgtct ctactaaatg tatgcagaga attataaatt	21120
gggaangtat aggtttctat acctcattga agtggtaaaa tgacaaacct gtgaanaagt	21180
acatacacac acacacgtaa gtatatataa atatatgtgt gtatatgtgt gtgtatatat	21240
atatatacat ataattgtaat acagcaacca ctacacacac tatacaaaga gataataacc	21300
aaaaacaatt tagataaatt gaaatggaaat tctaaaaaat attcaaatat tctacaggaa	21360
gacaagacaa aaagagaaaa aaagaggagg acaaaactaa ttttttaaaa acataaataa	21420
aatggtagac ttaagcccta acctatcaat aattacataa atgtaaatga tctaattata	21480
tcaattaaaa gacagagata gcagagttaa tttaaaaaca tagctataag aaacctgctt	21540
tgggtgtagt gcaagtgaac acacttgtaa tcccagcact tcggggaggcc aaggcgggtg	21600
gatcaacctg ggtcaggagt tccagaccag cctggcaccac atggtaatat cccatctcta	21660
ctaaaaatca aaaaaaatta gccaggcatg gtggcacacg cctgtagtcc caactactca	21720
ggaggctcgc acccaagcac tgcctgaccc cgggcagcag aggtagcagt gggccaaagt	21780
tgcgcacact cagcctgaac gacagagtga gactccacct cagttgaaaa acaaaaaaga	21840
aaactgcttt aaattataca acatatgttg gttgaatta aaagaataaa atatatcatg	21900
aaacattaa tcaaaaagaa ggaatggcta tattaatcac atanaataga cttcagagaa	21960
aaaaaaattt caagagacag gaataaaagg atcaagaaaa gctcctgaaa gaaaagcagg	22020
caaatcaatc attctgtctg gagattcaac acctctcttt aacaactgat agaacaccta	22080
gacaaaaaaa tcaagcatgga gttagagaaga acttaacacc actgaacac aggatctaatt	22140
agacatttac ggaacactct acccaacaat agcaaaaata acattctttt caagtattca	22200
ctgaacatat ccttagaccc taacctgggc cataaaaaca agctccctag tgattccga	22260
aggctlggat ggacagtgga agagctgcat ggggaggggag aagglgacag ttaaaagaglg	22320
taggattttc ttttgggata atgaaaaatg tccaaaattg attgtggtga tgttggcgca	22380
actctacaaa tatanaaaag gccattgaat tgtacgtttt aagtgggtga aacntatggt	22440
atgtggatta tatctaaagc tttttaaaaa cttaacacat ttcaagaat agaagtcata	22500
cagagtgtgc tctactggaa tcaaaactaga aagaggtaac tggaggataa cgagaaaagc	22560

-continued

ctccaaatac	ttgaaaactg	gacagcacat	ttctaaaatc	atccgtgggt	caaagatatt	22620
catttctgat	atctatttlt	attgtltaal	gtatttltlaa	aaatttctta	agggaalaa	22680
actgactaaa	aatgaatatg	gctgggtgcg	gtggctcagc	cctgtgatcc	cagcactttg	22740
ggaggccgag	gctgggtggt	cacaagatca	ggagttcgag	accagcctgg	ccaagatggt	22800
gaaaccccg	ctcaactaaa	aaactacaaa	aagtagccaa	gcgcagtggo	gggagcctgt	22860
ggccccagct	acttgggagg	ctgaggtagg	agaatcgctt	gaacacaggc	agcagagggt	22920
gcagtgagcc	aagattgtgc	cactgcacgc	cagcctgggc	gacagagact	gcctcaaaa	22980
aaaaaaaaa	aaaaagaata	tcaaaatttg	tgggacatag	ttaaaagcaat	gctgagaggg	23040
aaatttttaa	cactaaatgt	ttacattaga	aaaagagaaa	agtttcaaat	caatagtctc	23100
cactcccatc	tcaagaacac	agaagatgaa	gagcaaaata	aaaccaaago	aagcaaaaga	23160
aagaaaatat	aaaaataaat	cagtaaaatt	gaaaacagaa	acacaataaa	gaaatcagt	23220
gaacaaagt	actgattctt	cgaagatta	ataaaattga	caaacctcta	gcaaggctaa	23280
caacaaaaa	agaagaaga	cacggallac	cagtlallag	aalgaagaca	taattlagaa	23340
caactctaca	cattataaat	ttgacaatgt	agatgaattg	gactaattac	tgaaaaaca	23400
caattaccac	caactcaccc	aatatgaant	agataattgg	gatagcctga	taactactga	23460
gaaatttgaa	tttgtaat	taacactctt	aaaacagaaa	cattaaactt	aatattttat	23520
aaatattaga	taaggtaatt	atacccttcc	ttaacaaata	aaaacgacaa	attattttgc	23580
agclaaagag	atglalgtac	tgtagaaaal	atcttcagaa	aaatagaact	ttgtlllgaag	23640
aataaggatt	taaaaaatgt	ttttaactct	caagaagcaa	atatctgggc	ccagatgggt	23700
tcactgaaga	attctaccac	atgtttaatg	aagaattacc	accaaactcta	catagcctct	23760
ttgagaaaac	tgaagagaag	ggaacatctc	ccagttcatt	ttatgaagtg	ggtgttactc	23820
tgatactaga	actgtataag	gacagctact	cttgacacac	tgccatgggg	tagctctgct	23880
ctgcaggaa	agtcagaaaa	aaaaaaaaa	gaagcactgg	acaagggcag	tataaaaaa	23940
gaaactggg	ccaggtgcag	tggtctcac	ctgtaactct	agcactttgg	gaggctgacg	24000
ctggtggatc	acctgaggtc	aggagtttga	gactagcctg	gccaacatgg	taaaaacctg	24060
tctctactaa	atacaaaaa	ttagccaggc	aggttggtgg	ggaataaaa	aaggaaaaaa	24120
aaacaaaaat	aaactgcaga	ccaatatcct	tcatgagtat	agacacaaaa	ctccttaaac	24180
tccttaacaa	aatattagca	agtagaagca	atatataaaa	ataattatac	acctgatcca	24240
agtggggact	attccagaaa	cgaagctctg	gttcaacatt	tgaaaacaag	gtaaccact	24300
atatgaacgt	actaaagagg	aaaactacat	aatcacatca	atcaatgcag	aaaaaagcat	24360
ttgcacaaat	ccaatalcca	ttcatgalac	tctaaiaaga	aaaalaagaa	taaaagggaa	24420
attccttgac	ttgataaaag	ttacaaaaga	ctacaaaagc	ttacagctaa	cctatactta	24480
atggtgaaaa	actaaatgct	ttccctctacg	atcagggaaca	aagcaaggat	gttcaactctc	24540
attgtcttla	ttlaacatag	ccclgaagtl	ctaacctltg	caaaacgala	agaaagggaa	24600
atgaaagacc	tgacagattg	caaagaagaa	ataaaactgt	tcctgtttgc	agatgacatg	24660
attgtctcat	agaaaaatga	aagcaactag	gggtaggggg	gcagtggaga	cacgtgggtc	24720
aaaggatacc	aaatttcagt	taggaggagt	aagttcaaga	tacctattgc	acaacatggt	24780
aactatactt	aatataattg	attcttgaaa	atactaaaag	agtggtgttt	aagcgttctc	24840

-continued

accacaaaaa	tgtaaactat	gtgaagtaat	gcatacgtta	attagcacaa	cgtatattac	24900
tccaaaaaat	catgttgtag	atgataaata	caccaaattt	talcctgcag	tttaaaaaaa	24960
catgatatttg	gcagggcaca	gtggctcata	cctgtaatcc	cagcatttta	ggaggctgag	25020
gcgagcagaa	aacttgagggt	cgggagtttg	agaccagaat	ggtcaacata	gtgaaatccc	25080
gtctccacta	ataatacaaa	aattagcagg	atgttggtggc	gtgcacctgt	agaccacagt	25140
acttggggagg	ctgagggcag	agaattgctt	gaacaaggga	ggcagagggt	gcagtgcagt	25200
gggtgcacct	gcattccagc	ctgggtgacag	agtgcagctc	cattctcaaaa	aaaataaaat	25260
aaagcatgac	ttttcttaaa	tgcnaagcag	ccaagcgcag	tggctcatgc	ctgtaatccc	25320
accaactttgg	gaggccgagg	caggcagatc	acaaggctcag	gagtttgaga	ccagcctgac	25380
caacatggtg	aaaccccatc	tctactaaaa	aataataaaa	ttagccaggc	atgtgtagtc	25440
tcagctactc	aggaggctga	ggcaggagaa	tcacttgaac	ccggaggcag	aggttgcagt	25500
gttgagccac	cgcaactccag	cctgggtgag	agaaugagag	tcctgtctcaa	aaaaaaaaag	25560
caaaataacc	taattttaaa	aacctataaa	clactaagtg	aaltcagtaa	gtctttagga	25620
ttcaggatat	atgatgaaca	tacaaaaaat	aattgagctg	gacnaaggag	gattgtttta	25680
ggtcagtagt	ttgaggctgt	aatgcacaat	gattgtgctc	gtgaatagct	gctgtgctcc	25740
agcctgagca	gcataatgag	accacatctc	tattttaaaaa	aaaaaaaatt	gtatctctat	25800
gtactagcaa	taagcacatg	ggtactaaaa	ttaaaaacat	aataaatact	gtttttaatt	25860
goolgaaaaa	aalgaatata	tlacatalaa	alctaacaaa	algtgcagga	cttgltgltgt	25920
gaaactacaa	aaacgctgat	aaaagaatac	aaagaagact	taaatagcgt	gaaatatacc	25980
atgcttatag	gttggaaaaa	ttaatatagt	aaagatgccca	attttatcca	aattattaca	26040
caggataaca	ttattactac	caaaatccca	gaaaaatttt	acatagatat	agacaagatc	26100
atacaaaaat	gtatacggaa	atatgcanaa	gaactagagt	agctaaaaaa	aatttgaaaa	26160
agaaaaataa	agtggaaga	atcagttctat	ccagtttcaa	gacttacata	gctacagtaa	26220
tcagagctgt	gatattgaca	gagggcacag	tatagatcaa	tgcnaacaaa	tagagaaacta	26280
agaaagaagc	accacacaa	atgcaccaat	gattttctgac	aaagggtgta	aaacacttca	26340
acgggggaag	atatgtctct	cattaaaggg	tgtagagtca	ttgcacatct	ataggcaaaa	26400
agatgaacct	gaacctcaca	cctcacagaa	aaatttaactc	aaatgactc	aaggactaaa	26460
cataagatat	acattctataa	aacatttaga	aaaaggccac	gcacggtggc	tcacgctcgt	26520
aatcccagca	ctttggggagg	ccaaggcagg	tggatcacct	aaggtcagga	gtttgagacc	26580
agccggatca	acatggagaa	gccccatctc	tactaaaaat	acaaaattag	ctggacgtgg	26640
tggcacatgc	ctglaatccc	agclactlgg	gaggctgagg	catgagaatc	gcttgaaccc	26700
ggggggcaga	ggttgccgtg	agccaaagatc	acaccaattgc	actccagcct	gggcaacaa	26760
agcaaaaactc	caactcaaaa	aaaaaaaaaa	aaaggaaaaa	tagaanaatct	ttgggagtga	26820
aggcgaggla	aagaattctt	acacttgatg	ccaaaactaag	alctalaagg	ccagtcgltg	26880
tggctcatgc	ctgtaattcc	agcactttgg	tcaactagat	gaaagggtata	tgggaattca	26940
ctgtattatt	ctttcaactt	ttctgttaggt	ttgacatttt	tttagtaaaa	aattggggga	27000
aaagcctgac	gcagttggctc	acacctgtaa	tcccagcact	ttgggaggcc	ggggcaggtg	27060
gatcacacgg	tcaggagttc	gagaccagcc	tggccaacat	ggtgaaaccc	cgtctctacc	27120

-continued

aaaaataataa	aaaattagcc	gggtgtcatg	gtgcatgcct	gtaatccag	ctactgagga	27180
ggctgaggcca	ggagaatcac	ttgaacotlgg	gagglggaag	ttgcagtgag	ccgagallgl	27240
gccactgcac	tccagccttg	ggtagacagag	cagagactccg	tctcaaaaaga	aaaaaaaaa	27300
aaagaantatc	aaacgccttac	tttagaaact	atttaaaagga	gccagaattt	aattgtatta	27360
gtatttagag	caattttttat	gctccatggc	attgttaaat	agagcaacca	gctaacaalt	27420
agtggagttc	aacagctggt	aaatttgcta	actgtttagg	aagagagccc	tatcaatata	27480
actgtcatatt	gaggctgaca	ataagcacac	ccaaagctgt	acctccttga	ggagcaacct	27540
aaaggggttta	accctgttag	gggtgtaaatg	gtttggatat	ggtttgtttg	gccccaccga	27600
gtctcatggt	gaattttggt	ccccagtact	ggaggtgggg	ccttattgga	aggtgtctga	27660
gtcatggggg	tggcatatoc	ctcctgaatg	gtttggtgcc	attcttgtag	gaatgagtga	27720
gttcttactc	ttagttccca	caacaactgg	ttattaaaaa	cagcctggga	ctttccccc	27780
tctctcgctt	cctctctcac	catgtgatct	gactggttcc	ccttcccttt	atgcaatgag	27840
tggaaagcagc	ctgaagccct	cgcacagaagc	agatagtgat	gccatgcttc	ttgtacagcc	27900
tacaaaaacca	tggagcccaat	aaaccttttt	tctttataaa	ttatccagcc	tcagggtattc	27960
ctttatagca	agcaaatga	accaagccag	ggggaaatca	acttcattaa	aataatctat	28020
gcagtcacta	aacaaataag	aacaagaggc	tccagaagtg	ggaagccaat	accagaggtt	28080
ccacaaatc	agtatctgaa	aagtcagtt	tccaacccaa	aaatatatat	atacaggccc	28140
gacatggtag	cttatgtctg	taatccacagc	actttgggat	gttagggggg	gcagatcacc	28200
ctaggctcagg	agttogagac	cagcctggcc	aatatggcaa	aaacctgtct	ctactaaaaa	28260
tacaaaaaatt	agccagccat	ggtggtggat	gctgttaatc	ccagctactc	gggaggctga	28320
ggcagggaat	cacttgaaac	caggagggcag	agggttgag	gagccagagat	cacgccactg	28380
aaactccagcc	tggggcaacaa	agtgagactc	cacctcaaaa	aaaaaaaaa	tatacatata	28440
tatatgtgtg	tgtgtgtgtg	tgcgcggtg	tgtgtatata	caatatacaca	tatatacata	28500
tatacagaca	caatataata	tatgaagcat	gaaagaaac	aaggaaagtat	gaaccatact	28560
ttctgtgtgt	atgataggat	gggggtatcac	gggggaagta	gcaaggggaa	actgcaagtg	28620
agagcaaaac	gttatccgat	ttaacagaaa	aagactttgg	agtaaccttt	ataaatatgt	28680
ccacagaatt	aaagaaaagc	gtgattaaaa	aaggaagga	aagtatcata	acaattattac	28740
tccaaataga	gaatatcaat	aaaggcatag	aaattataaa	atatatacaca	atggaaattc	28800
cggagttgaa	aggtagaata	actaaaattt	aaatttcact	agagaagggt	caacactata	28860
tttgaactgg	cagaagaaaa	atttagtgag	acaaatatac	ttcaatagac	attattcaaa	28920
tgaaaaaata	aaagaaaaaa	gaatgaagaa	aaataaacag	aatctcagca	aaatgtggca	28980
caccttaaat	cacattaaac	tatgcatact	gagagttacc	gaagcagatg	agaaagagga	29040
agaaaaata	ttcaaatgat	ggccagtaac	ttcctagatt	tttgttttaa	agcaataaac	29100
talacaatca	agaaactcaa	tgaaltccaa	glaggataaa	tacaaaaaga	accacaaaac	29160
gatacacccat	ggtaaaaaatg	ctgtaaagtca	aaaacagaga	aaattattgaa	agcagctaga	29220
ggaaaactta	taagagaagc	tcaattacaa	agaacacatca	cttataaaaag	aaccacaata	29280
atagaaacag	ttgacctctc	atcagaacaca	atgaatgata	acataatttga	agtgctcaaa	29340
gaaaaaaaat	aaagattcct	atatacagaca	aagctgtctt	tcaaaaaatat	acatccaaaa	29400

-continued

ggattgaaac	cagggtcttg	aagagttatt	tgtacatcca	tgttcattagc	agcattatctc	29460
acaalagcca	aaaggtagaa	gcaacccaag	ggccaalcga	caaalaaata	aaatgtggta	29520
tatgtataca	caatggaaatt	tattcagtat	taaaaaaggaa	tgaattctg	acacatgcta	29580
caacttggtc	aaaccttgag	aacactatgc	taagtgaant	aagccagcca	caaaaggaca	29640
aataccatat	tacttcactt	gtatgaaata	cctagggtag	tcaaatcag	agatagaaa	29700
taaaacagtg	gttgccaagg	gctgaggag	ggagtaacgt	ggagtatttg	ttgaatgggt	29760
acagaatttc	agttttgcaa	gataaaaaga	gttctggaga	cagatggtgg	tgaggggtgg	29820
acaacatac	aaatatactt	tatactactg	aacagtatac	ttaaaaaatga	ttaacatggt	29880
gaaccccgct	ctctactaaa	aatacaaaaa	aattagctgg	gtgtggtggc	gggcacctgt	29940
aatcccgact	acttgggagg	ctgaggoagc	agaattgctt	gaaaccagaa	ggcggagggt	30000
gcagttagct	gagattgcgc	caccgcactc	tagcctgggc	aataagagca	aaactccgtc	30060
tcaaaaaata	aaaaataaaa	aaaatttaaa	aatgattaag	caggaggcca	ggcagctggg	30120
ctcacacctc	taatggcagc	actttgggag	gocgaggcag	gogalcaact	gagacccagg	30180
gtttgagacc	agcctggcca	acatggcaaa	accctgtctc	tgttaaaaat	acaaaaatta	30240
gcaggcatg	gtggcatata	cttataatcc	cagctactgg	tggagctgag	acacgagant	30300
tgcttgaacc	caggaggcag	agattgcagt	gagtcgagat	cgcgccactg	aattccagcc	30360
tgggcgcagc	agcaagattc	tgtctcgaaa	aaacaaaaac	aaaaacaaaa	agcaaaacca	30420
aaaaataatt	aagcaggaaa	cgagatlgct	gclgaggagg	agaaagatgt	gcaggaccaa	30480
ggotcatgag	agcacaaaac	ttttcaaaaa	atgtttaatg	attaaaaatgg	taatttttat	30540
atgtattcta	ccncaaaaa	aagggtctgg	ggcgaggaaa	tgaagggtgaa	ataaagacct	30600
ccagagaaa	caaaagtaga	gaatttgggt	ccttagaaga	aacaccacag	gaagtcttct	30660
aggtgaaaa	caagtgcacc	cagagggtaa	tctgaattct	cacagaaaaat	tgaagcatag	30720
cagtaaaagt	tattctgtaa	ctatgacact	aaacatgcct	attttttcct	ttcttctctg	30780
aatgatttta	aaaagcaatt	gcataaaaata	ttatatataa	agcctattgt	tgaacctata	30840
acatatatag	aaatatactt	gtaatatatt	tgcaataaac	tgccacaaaag	agagttggaa	30900
cazagctggt	actaggctaa	agaaattact	acagatagta	aagtaatatc	acagggcaat	30960
taaaaataaa	attttaaaaa	atttaaaaat	aataattaca	acaataatat	ggttggtttt	31020
gtaatattaa	tagacataat	acaaaaaatc	cacaaaaagg	gaagaagaca	atagaaatac	31080
ataggaaata	cattttggta	tctaactaga	attaaattat	aaatatgaag	tatatctctg	31140
taagttaaga	cacacatggt	aaacccatga	tactaaaaag	taactcacat	aaatacagta	31200
aaaaataaaa	taaaataatt	aaaatglttg	tattaglttc	ctcagggtac	agtaacaaaa	31260
taccacaaat	tgaagtggctt	aacacaactt	aaatgtattt	tctccagttt	ctggaggcta	31320
aaacactgca	atcaaggtga	gtcacaggcc	atgctccctg	tgaaggctct	aggaagaant	31380
ccccccttgt	ctctccagc	lccaglggt	ctccagtaac	ccaaagtgtc	cctlggcltg	31440
tagctatata	attcctagca	accagaaaaga	agaaaaataat	aaagattatg	gcaaaaaata	31500
atgaantcaa	aaggagaaaa	atggaaaaaa	ataaataaaa	ccaaaagcta	gttctttgaa	31560
aagatcaacc	aagttaacaa	accttttaac	tagactgaca	aaaaggaggt	aagactcaaa	31620
ttactagaat	cagaataaaa	agaggggaca	ttactaatga	gggattagaa	aagaatacta	31680

-continued

cgacacaaatg	tgtgcccaaca	aattagaaaa	cttagatgaa	atggacaggt	tcctaggaca	31740
acalcacacta	ccaaaallla	ctcagaaga	agagacacat	ttgaatgagc	lalaacaaag	31800
gaagagactg	aattgacac	caagaaacta	tcacacaaaga	aatccacag	ccagagaagt	31860
ttcaactgtga	aattcttctca	aacttatana	tataaattaa	catcagttct	tcacaaactc	31920
ctccaaaaaa	aagaacagat	ctctatltac	aggcgatacg	atcttttagaa	aatcctaagg	31980
gaactactaa	gacactatga	taactgataa	acaagttcag	caaggctgca	ggatagaaaa	32040
cccatataca	aaaatctatt	atatttttat	acacttgtag	tgaacacccc	aaaatgaga	32100
tteagaaaaat	aattcaattt	acataacat	caaaaagaat	aaaaacactc	aaaaataaat	32160
ttattcaagt	aagtgcacaaa	cttatactct	agaagctaca	aaacactgtt	aaaaaagatt	32220
aaaggtttac	ataaatgaaa	aactatocca	tgttcatgga	tcaaaagact	tattactggo	32280
aatgctctcc	aaattgatct	ataaattcaa	caaatccctt	atcaaaatcc	cagatgaggc	32340
tgggggttgg	ggttcatgac	tgtaatccca	gaactttggg	aggctgaggg	acgagagatta	32400
cttgagglog	ggagctcgag	atcagcctga	ccacacatgga	gaacacctat	ctctctctaaa	32460
aatacaaaat	tagtccaggcg	tggtggcaca	tgctataaat	cccagctact	cgggaagctg	32520
aggcaggaga	atcgcttgaa	cccaggaggg	agaggttgca	gtgagccaaag	atcgtgcact	32580
tgcaactccag	cctgggcaac	aagagcaaaa	ttccatctca	aaaaaaaaaa	aaaaaaaaatc	32640
ccagatgact	tcactgttga	aattgaaaag	attattctaa	aattcacatg	gaattgcaag	32700
accltgagaa	tagccaaaaa	aaacttgaaa	aacacgaaca	aaatalagga	lgactcacit	32760
gcaaatgca	aatgttaoga	cacagcaaca	gtaatcaaga	ctgtgtggta	ctggcaaaa	32820
acacatacat	acatacatat	caatggaata	taattgagag	tacagaaaca	agcctaacca	32880
tctatggtaa	gtgcttttct	atttttttct	tttttttttt	cttttttgta	gagatagaat	32940
ctcacactgt	tgcccaggct	ggtcttcaac	ttctgggctc	aagcaatcct	cccactgtgg	33000
cccccacaaag	tgtctgggata	actggcatga	gcccaccacat	ccagcccaga	tgattttcaa	33060
aaaagtcaac	aagaccatcc	ttttcaacaa	ataggtcttg	gatgatcaga	tagtcaacg	33120
aaaaaaaaaa	tgaagtttga	ccctccatca	cactaaagtg	ctgcgattat	aggcatcagc	33180
ccaccatccc	agcccaaatg	attttcaaaa	aggtcaacaa	gaccattctt	ttccacaaat	33240
aggctctggga	taatcagata	gtcacatgaa	aaaaaaaatg	aagttggacc	ctccatcaca	33300
ccatctgcac	aaattaattc	aaaatgaat	tgatgactta	aacgtcaagag	ttacgactgt	33360
aaaactctta	gaaggaaaca	tacgggtaaa	tcttaaagac	gttaggtttg	acaaagaatt	33420
cttagacatg	acacaaaaag	catgaccaac	taaggtaaaa	tagggtaaat	tgtacctacc	33480
aaaatgaaaa	accltltgtc	tggaaaggac	accatcaaga	aalggaaagc	caaaatagcc	33540
aaggcaatat	taagcaaaaa	gaacaaagct	ggaggcatca	tactacctga	cttcaaaaca	33600
acagtaccca	aaacagcatg	gtactagtay	aaaacacagc	acatagacca	atggaacaga	33660
alaaagaacc	caaaaalaaa	lccacalatl	talagtcaac	tgatltltlga	caatgacacc	33720
ccctcaataa	atgatactag	gaaaactgga	tatcgatatg	cagaagaata	aaactagacc	33780
ccctatctctc	accatataga	aaaatcaact	cagactgaat	taaaagactg	aatgtaagcc	33840
ccaaaactat	aaaactactg	gtagaaacaa	taaggaaaaa	cgcctcagga	catgtgtcca	33900
ggcaaaagtc	ttatggctaa	aacctcaaaa	acacaggcaa	caaaaacaaa	aatggaaaaa	33960

-continued

tagcacttta	ttaaaactaaa	aagctcctgc	acagcaaaag	aaacaacaga	atgaaaaagc	34020
aacctgtaga	atggggagaaa	atatllgcga	actalccatc	catcaaggga	ctagtalcca	34080
gaacacacaa	gtgactaaaa	caactcaaca	gcacaaaaagc	aaataatctg	gtttttatat	34140
gggcnaaaga	tctgaataaa	cattctcaaa	ggagagcata	caaatgtcac	tatcattctg	34200
ccagtaacc	actgtcttga	ttactltgta	gtgtataaat	ttttaaatlg	ggaagtgtga	34260
gtcatcctac	actttgttct	tgtttttcaa	gtttgttttg	gctattcttg	gagccttgca	34320
agtataaaat	agccaaacag	tatgaaaaaa	tgctosccat	cactaatcat	cagagaaata	34380
aaaatcaaga	cactatgag	atatcctctc	actccagtta	gaatggctac	tatcaaaaag	34440
acaaaatata	atggatgctg	gcaaaagattt	ggagaaaagg	gaactcctat	acactgtggg	34500
tagggatgca	aattgttaat	ggccattatg	gaaaataata	ctgagggttt	tcaaaaaact	34560
gaaaatagaa	ctaccataatg	atccagcaac	cctactactg	ggtattttatc	caagggaaa	34620
aagtcagtat	actgaagaaa	tatatgcact	ctcatgttaa	ttgcaaacct	gttcaacaca	34680
gccaaagacg	ggaataaata	taaatgtgca	tcaacagatg	aatggataaa	gaaaatgtgg	34740
catatacact	caatagaata	ctattcagcc	attcaaggaag	aatgaaatcc	tgtcatccca	34800
gcacatgga	tgaacotgga	ggacattata	tttaattgaaa	taagttaagc	acaaaaagat	34860
aaacagtaca	tgtttctcact	cagacatggg	tgctaaaaag	aaaatggggg	cacagaatta	34920
gaaggggagg	cttgggaaaa	gttaatggat	aaaaatttac	agctatgtaa	gaagataaag	34980
littagtgtt	ctatagaact	gtaggggag	tatagttacc	aataacttal	tgtacatgtt	35040
caaaaagcta	gaagagattt	tggtgtttcc	cagcacaaag	gaatgataaa	tgtttgtgat	35100
gatggatata	ctaattaccc	tgtattcaatc	attacacatt	gcatacatgt	atcaaattat	35160
cactctgtac	ctcataaata	tgtataatta	ttactgtcaac	aaaaaaagga	aaaaaaagaa	35220
aattaagaca	accacacata	tggaagaat	aaaatatctg	caaatatata	atatctgata	35280
aattattta	atttataata	tataaagaac	tactacaaat	caagaaacac	aaacaaacaa	35340
cccaattcaa	aaatgggttaa	aagccttgaa	tatacacctta	tctaaagact	atatacaatt	35400
ggccataaaa	gacacagaaa	gatgctcaac	atcactagtc	atcaggggaaa	tataaatcaa	35460
aaacccaatg	tagaatgtag	acacacattc	atatgaacta	ggatggctag	aataaaaagg	35520
taataacaaa	tgttggttaag	gatgtgaaaa	aatacagaac	ctcattctgt	gtgtttggga	35580
atgtaaatg	atgcagccac	tttggaaaa	agtctggcag	ctcctcaaat	tattaaatac	35640
agagttaccg	tatgaccacg	gaatattcct	cctgggtcta	taacaaaaaa	aatgaaaaca	35700
tatatccaca	taaaaaacttg	tacatgggca	tttatagcaa	cattattcat	aacagcaaa	35760
glggttaagaa	cccatatgcc	catcatctga	tgaacaggta	aataacatgc	ggtattatal	35820
atacactaga	atatattctg	cccatacaag	gagtgcacac	cagctacatg	ctacaaggat	35880
gaatctcggg	aactctatgc	taagtgaag	aagccagtca	caaatgacca	cagattatga	35940
tlccatgcac	cggaaatgac	cagaataggg	aaatctatag	agacagaaa	tagatttaglg	36000
gttgggtggg	gctgggagga	caggtagtac	actactttcc	cagaactact	ggaacaaaat	36060
aacacaaact	ggggagctta	aacatagaaa	ttgatattct	cacagttctg	gagactagga	36120
ctctgagatc	aagggtgcag	cagagctggg	tctttctgag	ggcctgagg	caaggctctg	36180
tcccaggcct	ctctccttgg	ctggcagggtg	gcacattctc	cctgcgtctc	tcacatcctc	36240

-continued

ttttctctgt	gtgtgccc	at	gtccaaattt	tgattggctc	attctgggto	atggccaatt	36300
gctatgcaca	aagtgaaglc	lactlccaaa	agaaggggaag	agggaaaccl	gactaggcta		36360
aaacttatagt	cattttaatg	tcgcgttttc	ctatgagatt	gtgaacacac	agaagtaggg		36420
tttttatcta	cattgtgcaa	agtttaataa	gaaaaataga	attcaagaga	agcagttcaa		36480
tagcaggaat	ttaatatggg	aactaattac	aagggttagg	gcaggactaa	aaagccaglt		36540
gggatgggtga	gccaaaccag	agattagcaa	cagtgaggac	ccatctacct	accaccatg		36600
aagctggaag	gataaaggag	gggtatttat	cagagtccac	aagccagtg	cagagtccct		36660
ggctggagct	gggaccaccc	tagagacact	gtgcaaaagca	gaaaaacaagg	gggaaaaacc		36720
ctgaactctc	cattccctcc	acctttcaat	ctcccactag	tgtctccctac	tagccatact		36780
tggccagaga	cagtgcacaag	gaacactgca	aaatgaagtt	tgtaggaaat	atctccctct		36840
gagacagaga	aatatggaag	ggtagaaaat	gaatcagagg	ataaagagaa	aaaaccctga		36900
gtactatctt	atttatcttt	gtatctccag	tgcctaattct	gtctctcaaa	aaaggaagag		36960
aattgagaga	aactgaaaaa	tccaatlgaa	atgaaagaat	ggagaattac	tggactagaa		37020
gagaagagaa	aaattttatt	cgcataagag	aaacaagaat	ggattccaaa	aggacgtgat		37080
gaatgaaaaa	ctataatcag	caagaatttg	ccagagaaat	taaaaaagtg	taaaactcag		37140
cacgctgtac	aacctgaagg	cacaatgcac	gaaaacgttt	caagaaatga	caagatttga		37200
agtcaaatcc	taagtgcctt	tccagaatct	ctcaagacga	ttatatagct	acccctcttt		37260
attaaataaa	alggaaaccl	actaaacttt	cccttggtat	taaaactaaa	tatgtcctaa		37320
tagcaaacga	ttctggaatt	cctagagtaa	aatatatctc	gtcaaaagtg	attgctcttt		37380
taatatctct	ctgacctcct	tttgctattt	aggatatttg	tatacacatc	acacgttaat		37440
ttggtctata	gtttacatct	acgggcttat	actgttcttt	ttttcatttt	tttaaaattt		37500
ccaaccccca	gtatccatct	actgctctct	atcagggtta	ttttaacttt	gtaaaatcag		37560
ctgagatgct	ttccatgttt	ttttttttta	ttttttgcca	catttgtaata	gcataaggag		37620
taccaccatc	aaccttggat	tatttaagca	tccacgatto	cacgtgtgga	ttttttatto		37680
agagtctttc	ttgtcattcc	tgctatcagc	acagacccca	atctcagctt	tccagctata		37740
ctctcacccc	atggaaatttg	cagatgaagt	tcaaaaggac	ctttgcatta	tccgtccctg		37800
ccctctctcc	catctattta	gacatcacct	tctctataga	ctctctacct	gacatccctc		37860
gtccccaacc	cctgctgccc	aattgtgtgc	tctcccgctg	cctggccctgc	cactcctctt		37920
agtaattgcc	tgctccctca	tctgtctccc	caccacagaca	ttaagctgaa	tagactggat		37980
ttgtgtcttg	tccatcacta	taatctcagc	acctagtacc	tagtaggtac	ttaccatgta		38040
ttcattagca	aaatgtttaig	tataaccttg	caccttaaaa	acaagagaag	gaagacaaaa		38100
tttaagctcta	agactatggg	ttagaaacatg	gatcagaaac	tacagctctg	agcccaaatc		38160
cagaccaaat	gaagagacaa	tgttcaattta	catacaaacct	atagcagctt	tcacactaca		38220
ggagcagago	taagtagtlc	caagggaaca	cacggccctg	caaagcctaa	aatatttlaa		38280
ctatagctct	tcacagaaaa	agttttcaga	tccctcgctt	agaaactctg	ttcatatgca		38340
atttcaactaa	accatagttt	tttgggtttg	tttgggtttt	tttggcaaaa	aggaatgagc		38400
cgatccagaa	aaggttgaaa	agaatgaatc	attactgctg	aaagaatgtg	cacacagctc		38460
gtcagtattc	tgctgcacatg	ctgacaccca	tccaatagtg	tcatgagatg	cagcagctac		38520

-continued

tactgtgttc	tcaatgcoga	gtccacccac	tccataacca	tgccaagca	atcttgggaa	38580
catcatcacc	atgcttgttt	atccttaagg	tattgcctca	calacagcag	tggtgggla	38640
taaaagtc	agacacag	ggccaggagg	tcaagagaat	gagtgaggac	aggtgggtag	38700
gcagccag	ccctagcaac	agcaggagct	cacccctcag	tcactctagc	caggactgan	38760
alacttttca	cccttccaag	agagactagg	aactctggatt	tttatgtgaa	atatcttgat	38820
tactaaatgt	tgtaacaga	catgtcaaaa	ggtaaaacta	agtaagtcca	tggggcagat	38880
tgcctattca	ggttatagaa	tttaaggatc	ttatccaaca	cagatacca	ccaaaaagct	38940
gacgtataac	atattaggag	aaactatgtg	cactgtcgaa	acatcaacaa	ggggctaagt	39000
tctaaaaatg	tctatattgg	attccagtgt	aaacatgggg	aagggacatg	aacaggcaac	39060
ttatgtcaat	ggaaactcaa	aaagataaca	agcatatata	aaagcattct	caaattcagt	39120
agtaaacaga	cagatgcaca	taaaaagagg	gaaactgctg	cggggcacag	tggtctcacac	39180
ctgtaatccc	agcacttttg	gaggccgagg	cgggcggatc	atgaagtacg	gagatcgaga	39240
ccatcctggc	taacatgggt	aaaccccgtc	tctactgaaa	acacaaaaaa	tlagccaggc	39300
gtagtggtgg	gcaccagtag	tccagctac	tcaggaggtt	gaggcaggag	aatggcatga	39360
acccaggagg	cggngattgc	agtgaacga	gacacgtcca	ctgcactcca	gcctggggca	39420
ctgagtga	ctccatctca	aaaaatataa	taataattat	aattataata	ataataaata	39480
gtaataaat	aaaaagagag	agactgctaa	agtctagaaa	gttgaatgat	gccaaagcca	39540
tgcaaaagac	agggccttgg	galggccggg	tgacgtggct	cagccclgta	atccccacc	39600
tttggggagg	caaggcgggc	ggatcatgag	gtcaagagat	caagaccato	ctggccgaca	39660
cagtgaaccc	cggctctctac	taaaagtaca	aaaaaatata	tatatatata	tatatattata	39720
tatttatatat	atatatatca	gagccttggg	aatccttgtg	tgtctgtggg	gaaggtagtg	39780
gtgcagccac	ccttgacagc	aatctggcag	tacttggtta	tattaaatga	aggcacacac	39840
cagcaaccag	cagtcctact	cctgggtcta	aatccccaa	aattctcaaa	caagtccata	39900
aggagacatg	tacgaggctc	attcagcatt	actgggagtg	ggaatcaacc	tggtgtgtcca	39960
tctacaggag	ccngagatgga	aaaaatgttg	tggtatttaa	gaccagaatc	accnaagtaac	40020
agcagtgggt	ggtgagtgac	aatcctaaga	tacagaataa	aggctagaac	atgatgcact	40080
tcagttaaat	taaaaaataga	tgccacacaa	gcagtatacg	ctgacccctt	gaatagcaca	40140
ggtttgaact	gcctgtgtcc	acttacatgt	ggattttctt	ccacttctgc	taccccccag	40200
acagcaagac	caacccctct	tcttctctct	ccccctcagc	ctactcaaca	tgaagatgac	40260
aaggatgaag	acttttatga	taatccaatt	ccaaggaaat	aatgaaaaat	atattttctc	40320
ttccttatga	ttttctttat	ctctagctta	cattatttca	agaatatggg	acataataca	40380
catcacacgc	aaaaataatg	ttaatgact	gtttatatta	tggttaaggc	ttccactcaa	40440
cagttagctg	tcagtagtta	agttttggga	gtcaaaagt	atacacagat	tttcaactgt	40500
gcaggcaalc	agtlccccctg	acccctccal	tggtcaacggg	tcaactglat	alacacaaaa	40560
gtatttatatg	aacctcatta	gaatagctgt	ctataggggag	aagagaatga	gagtgggata	40620
aaacgggaatg	aaacaaataa	ccaaacaantg	cattaaacag	caaaacaaca	gaggggcttg	40680
catggggccag	tgatgataaa	gggctaagaa	tgagaatata	attaattcaa	ttctccacac	40740
ctgaggtcta	aaaccaagga	aagggaaggc	caggcgtgga	ggctcacgcc	tgtaatccca	40800

-continued

gcacatttggg	aggctgaggc	gggaggatca	caagattagg	agtttgagat	cagcctggcc	40860
aacacagtga	aagcccatct	ctacaaaaaa	tacagaattt	accagggtgt	ggtaggcacat	40920
gcctgtgatt	agctactctg	gaggctgagg	caggagaatc	acttgaacco	aggaggcgga	40980
ggttgcaggg	agcgcgatac	acacccattgc	actccagcct	gggtgacaga	gtaagactct	41040
gtctcaaaaa	aataaaaaaa	ataaaaaaac	agagaaaggg	aggaaactag	atccaggctg	41100
actagataca	gccttttagag	ttagaaaaa	tgatttgaca	atctaagccc	acactcagat	41160
tgaatgaat	tgaanaagcct	ttaaaaaata	aacatttaata	tacaccatct	gctgacagca	41220
gaactcagac	aactcaaaac	ggtaatgtca	gcgtgggtgtt	tatatatcac	accccaaca	41280
cagaataaaa	atcagctgca	tgtgaagcag	tgaactagaat	gaagaaaagg	ctgctcttta	41340
cttccttcta	gtggttcttt	cggaaaaacat	taataggcac	cagctctatg	catgtcacc	41400
tgaggggaga	catgggggat	ataactatga	cttactgttc	attcctcaag	gaattcccaa	41460
tcttgtgtga	gattatatac	aatgaggcaa	caaaaaactat	ccaataaaaa	cacggaaaag	41520
aagccagtga	caaaagaagc	agtgatgaaa	ggccctgtga	gcagagctga	tggccatttg	41580
gggaagaaa	acaaacatgg	atgggggtga	tcagggtggc	tccgtgggaa	agctggaaga	41640
gaagtggcag	atctctgagc	tggatgatgg	gcccctacaa	tctgtatatg	gctaattaaa	41700
gaccatgtgt	ggatttttta	tacagctctt	tctgtctatt	cctgctatca	gcacagaacc	41760
caatctcaac	tttccagcta	tattgagcta	aacttctcac	ctcatggaat	ttgcagataa	41820
agttcaaaa	gatccttgcc	ttttcaaat	aattttgaat	ggttgagtag	tccctctgtg	41880
ctctctcact	gacacccctct	caaggctgct	gagcacgtgc	catgctatgg	cttctccaa	41940
cattcaggaaa	tgttctccac	tcagtttcc	cttaatacaa	atgtgttctc	tcttcagaga	42000
aggcaaaaa	attcatgacc	atctgactgg	gagaagtcat	tcttaggtaa	agtgctccatc	42060
tttttctgag	gaacacagga	ggaaaaatctt	acagaaaaa	gttaaacacag	caggccctaa	42120
actgcttttt	aaaaataata	aataaataaa	taataaata	aataaataaa	taataaata	42180
aataaatgaa	tgatagggtc	ttctgtattg	gccaggctag	tctcaaatcc	ctggcttcaa	42240
gagatctctc	caccttggtc	tccacacgtg	tgggtattat	agacatgagc	cattgtgctt	42300
ggcccaagac	tgttattctt	aaaagctctc	ataaaaagca	tggttaatcc	ttggctggca	42360
cctgggaact	tgattttcag	aagggttccc	accatccaac	ctggaaagag	ggaactcactg	42420
tgcctaaatt	attgtgtggt	ttatgctgaa	ctcctgcttt	tcttcaggta	gcgtggaatg	42480
tggtatgtgc	tgggcaaaag	gggcctgcat	gaccagcccc	caataaaaaac	cctgggtgtt	42540
gggtctctag	tgagtttccc	tggtagacag	catttcacat	gcgttgtcac	agctccttcc	42600
tggggagatt	aagcacatac	atcctgtgtg	actgcaactg	gagaggatgc	ttggaagctt	42660
gtgcctggct	tcctttggac	tggccccat	gcacatttcc	ctttgtgat	tgtgctttgt	42720
atcctttcac	tgtaatcaat	tacagccgtg	agtaacccac	atgctgagtc	ttccaagtga	42780
accaccagat	ctgagcatgg	tcttgggggc	ccccaacaca	gaaataaaatt	ataaaagacc	42840
aaggactggg	catgggtgac	catgccggtc	atctcagcgc	tttggggaggc	cagggcagga	42900
ggcccaagta	agcccaaaag	ttaaaagtta	cagtgacctc	tgaactggcc	aatgcaactct	42960
aacctgggag	acagagcaag	acccgtgtcc	caaaacaata	aactaaacac	atacttctgc	43020
cttccaaagt	tcttaaaatt	caatggaatg	gtagaacat	ttttaaaaca	ctaaatcaaa	43080

-continued

agaaacctgg	aaaacaagag	tgccgatggc	caactaaaat	gtctaggaaa	ttcttgaaaa	43140
glaaaaagta	ctcagaacca	gattacotga	gcaaacccata	gcccaataca	agcttggggag	43200
gaggctgtta	tcgagaagga	aatggtaaca	ggtttccagg	aacagacttg	taacagcaga	43260
tagaacacga	gaggtagaac	ctgacaaggt	gattacctgg	ggaactgcag	tctgaatgac	43320
caggactgtt	ggacccttcc	cctcacatgg	aatacacacg	ccactcagca	gcacaccaca	43380
gctcttcaac	aatcacagga	ggcacgctac	gcctagtaag	acagagaaaa	aggaattctc	43440
aaactctoga	gatgaacaca	taagaatca	ccaagttttt	attcagtatg	atgaaacagg	43500
gacactgaat	caacagaaaca	caaacccaag	caaagataat	tactagagca	catagaagaa	43560
attattagat	attcttggga	agacctaaag	ggacattata	aagagcaagc	agttggtatg	43620
tgcgatctt	tgtgatatac	caagaaataa	aaacacagga	tgaagaccag	atagagaata	43680
atgctactat	ttgtgcaaaa	aaggagaaat	ggagaatctg	attcatattt	gcttgtatatt	43740
gcctgaagaa	actttggaag	gtacataagt	aactaacaac	aatggttaac	tacttgytaag	43800
gcgagagaag	taagaggaca	ggaatgggtg	gaacaccttt	tgtgtccgga	attggtgggt	43860
tcttggtctg	acttggaagaa	tgaagccgtg	gacctctcgg	gtgagcgtaa	cagttcttaa	43920
aggcgggtgtg	tctggagttt	gttcttctcg	atgttttggat	gtgttcggag	tttcttctct	43980
ctsgtgggtt	ctgtagtctcg	ctgactcagg	agtgaaagctg	cagacctctg	cggcgagtg	44040
tacagctctt	aagggggcgc	atctagagtt	gttcgttctc	cctggtgagt	tcgtggtctc	44100
gctagcttca	ggagtgaagc	tgacagacct	cagggtgtgt	gttgacgctc	atatagacag	44160
tcgagaccca	aagagtggag	agtaataaga	acgcattcca	aacatcaaaa	ggacaaacct	44220
tcagcagcgc	ggaatgcgac	cgcagcacgt	taccactctt	ggctcgggca	gcctgctttt	44280
attctcttat	ctggccacac	ccatatcctg	ctgattggtc	cattttacag	agagccgact	44340
gtccaccttt	acagagaacc	gattgggtcca	tttttcagag	agctgatttg	tcctttttga	44400
cagagtgtctg	attgggtcgt	ttacaatccc	tgagctagac	acaggggtgt	gactgggtga	44460
tttacaatcc	cttagctaga	cataaagggt	ctcaagtccc	caccagactc	aggagcccag	44520
ctggcttccac	ccagtggaac	cggcatcagt	gcccacgggtg	gagctgcctg	ccagtcccg	44580
gcctgcgcgc	cgactctctc	agccctcttg	tggtatagtg	gactgggcgc	cgtggagcag	44640
ggggtggtgc	tgtcaggagag	gctcgggcgc	cacagagagcc	caggaggttg	gggtggctca	44700
ggcatggcgg	gcgcgaggtc	atgagcgctg	cccgcagggg	aggcagctaa	ggcccagcga	44760
gaaactgggc	acagcagctg	ctggcccagg	tgctaaagccc	ctcactgcct	ggggccggtg	44820
gggccggctg	gcggcccgct	cccagtgccg	ggcccgcaca	gcccacgcgc	acggggaact	44880
cacgtctggc	cgaagcacc	gcgtacagcc	ccggttcccg	cccgcgctc	tcctccaca	44940
cctccctgca	aagctgaggg	agctggctcc	agccttgccc	agcccagaaa	ggggctccca	45000
cagtgagcgc	gtgggctgaa	gggctcctca	agcgggccca	gagtgggcac	taaggctgag	45060
gaggcaccga	gagcgagcga	ggactgccag	cacgtgtlca	cctctcactt	tcattttatg	45120
cttttttaata	cagctctggt	ttgaacactg	attatcttac	ctattttttt	tttttttttt	45180
tggagtggag	tcgctctctg	tgcgccagac	tggagtgcag	tgggtgcata	ctggctcact	45240
gcaagctccg	cctccgggtg	tcacaccatt	ctcctgcctc	aacctcctga	gtagctggga	45300
ctacaggcaa	tcgcacccac	gcccagctaa	tttttttatt	tatttttttt	ttagtagaag	45360

-continued

<hr/>	
cgaggtttca ccatgttagc cagatgggtc caatctctg accctgtgat ccacccgctt	45420
cggcctccca aagtgcgggg attacagacg tgagccactg gcgcctgctt atcttaacct	45480
tttcaaaagt taacctttaa gaagtagaaa cccgtggcca ggctgggtgg ctacgcctg	45540
taaccccgag aotttgggag gccgagggcg gggatccag aggtcaggag atcgagatca	45600
tcctgggttaa cacagtgaac cccgtcgtc actaaaaata caaaaaatta gccggggcgtg	45660
gtgggtggga ccggcagtc ctcgtactgg ggaggtctgag gcaggagaat ggcgtgaacc	45720
tgggaggcag agcttgccgt gagccgagat agtgccattg ccttcacagc tgggagacag	45780
agcgagactc caccctcaaa aaaaaaanaa aaatatagaga cccggaaagt taanaatatg	45840
ataatcaata tttaaaaaca ctcaagagat gggctaaaga gttgacggaa caaatctaaa	45900
tattagattg gtgacctga aaccacgccc aaggaaacat ccagaatgca gcccataaag	45960
ataaagagag catttccgct gggcacagtg gtatggcagg ggaattgcct gactccaaga	46020
gttgccaggtc acattgaacc acacccattg accccaggcc tgggcaacac agcaatactc	46080
tgctotcaaa aaaaaaaaaa ttaaatlaaa aaagacagaa tatitgagag aaaaaaatg	46140
ttatttcaag aaacatgaac gataaatcaa gatattctaa ttcccgaagta agaatatttc	46200
cagagcgaga aaatagaata gaggcaagga aacactcaaa acttctccag tgcctataga	46260
atgtgtatta atctttagaa tgaacaggac taccaaatgc tgagcaggaa gaacaaaaga	46320
gatccactct taagccagtg tgggtgcccac gccagctggc tcatgcctgt aatccacga	46380
ctttggggagg ccgaggcagg tggatccact gaggtcagga gtttgagatc agtcaggcca	46440
acctgggtgaa accctgtctg tactaaaaat acaaacatta gctgggtgatg gtggtgaca	46500
tctgtaatcc caactacttg ggaggtcaag ccaggagaat caattgaacc caggaggtgg	46560
aggttttagt gagccgagat catgccacac tcccagcctg ggtgacagag caagattcca	46620
ttccaaaaaa aaataccact cctagacaaa taatagttaa attttagaac accaaggaga	46680
aagaaaaaaa attgttaang ttccagagaa ataaacatta actacaaaga aacgagagtc	46740
agccgctgto acttctctct agataccagc agataaaaga atatctccaa aattcagaag	46800
gttttaacgt agaatctctat acccagtcac gaatatctac atggaaaagt gaatataaa	46860
acattgttta aacatgcag ggctcagaaa gtttaacctt ccacgaatcc ctgaaaaaa	46920
aaaccaataa tcaactaagg actcattaag aaacaaatg aaataaaaag accaatgat	46980
agtaataat cagaaaaatt tacagtttac cttaataact gtttatgcat aatgtatga	47040
aaacaaaaaa tttaatatgg gacagaatta aaatcatgat aagattcttt ttgtctttac	47100
tcattggagag ttacacataaa cagattatct tttaatagca agagaaaaaa atgttttagat	47160
atgtgtgaaa aaactaaggt accaaaaacg tgcaaatcca ttatcatcca ggaaaaatcca	47220
aattaaaaac acagtatcca ccagaataac taacaggtaa aagacagaaa ttaccaagag	47280
ttggcaagaa tgtggagcaa ccaatataac ttctggggta aataagttgg tgcaacgggt	47340
actgaaaact gtttgclagt atctactaaa accgagcaca tgcacagact acaacaaagc	47400
agttccactc ccagatacac actcaacaga aatgcacaca ctcaactaac aaaaagcgtg	47460
tactagagtg ttactgtact tactattcat aatagtcaca aaatgcacaa aacccactgc	47520
caatcaaaag caaatgtata tctatatag ggatatatac aatggcatat acacagcaat	47580
gagaatgaaa tgaaccagct cggcacagtg gttcatgcct gtaactccag caatttgggc	47640

-continued

gggtaaggca	ggcagatcac	ttgaggtcag	aaatttgaga	ctagcctggc	caacacggtt	47700
aaaacctgic	ccactaaaa	acacaaaaal	tagcggggca	tagtggtlgc	aggcctglaa	47760
ttccagctac	tcgggaggct	gggttgaggag	aatcgtttga	accgaaaagc	cggagggtgc	47820
agtgaagcga	gntcgtgcca	ctgcaactcca	gcctgggacga	tagagcaaga	ctcctgtcca	47880
aaaaaggaaa	tcaaaaaatat	aaaataagat	gacaggaata	atccgcaaaa	gacagtaaat	47940
caaaataaat	ataaatgggc	taaagctacc	tattaaaaga	caaagatttc	acaccataa	48000
ggatagctac	tatcaaaaaa	agagagagaa	taacagatgt	tagcaaggat	gtatggaaaa	48060
tgaattcttc	acgcatttgc	ggtgagaata	taaaatgggt	cagcctctgc	ggaanaacat	48120
atgctgggtc	atcaaaaaat	taaaaataga	agtactactt	gatccaacaa	ttctacttct	48180
gggtatatac	ccaaaaaact	gaaagcaggg	tcttgaaagag	atatgtgtac	acccatgato	48240
atggcagcat	tattcataat	agctatgatg	tggaaaccaac	ataaatatcc	tttgataaat	48300
atatggataa	gcaaaatgtg	gtgtatacat	tcaatggaaat	attaatttagc	aataaaaatg	48360
aagaaaaatc	tgacacatgc	tacaacatgg	atgaacottg	agggcattac	attaaatgaa	48420
ataagccagt	tataaaaaa	caaatactat	atgaggtact	atattagata	ctcatgcaag	48480
gtccctaaaa	taggcaaat	catagagaca	aaagcgagaa	tgggtggttc	caggggctgc	48540
ggtaattgat	acagagcttc	aattttgtaa	gatgaaaaaa	ttctggagat	tgggtgcata	48600
acaatgtgca	cacacttaac	actgggggac	tgtaaactta	aaagtagtaa	atggtaaaaa	48660
taaaaataat	aaataataaa	ttttatgtta	ttttaccaca	ataittatta	aaagacaaa	48720
attaactaat	taaacaaaa	ccagccataa	gctaattgta	agagtaacaa	ttaaagaaga	48780
cacagaaaat	tgaanaatcag	tgactagaaa	aagatattcc	atataaatgc	taacnaaaag	48840
caagtacagc	aataataaga	gaatgaacaa	aaaaaaaatt	aaataagatg	gtcgttttat	48900
tcccaaaagg	tacaattcac	caagaagata	caagaattgt	gaacctttaa	gcacataaaa	48960
cagcttcaaa	aatacaacat	ttaaagaaaa	atatatatata	aacatagaaa	tagtacaaaa	49020
acccctacaa	gaatcataat	gggagtcctc	aatacaactc	tccatataca	cagggtcaaac	49080
agagaaaaaa	aataagttta	ggatgcagaa	aacctgaatt	accatcaata	aacttgagat	49140
taetotagaa	ctgtataccc	aataacttaa	gagttcaggg	aacagtcgtg	actgacagtg	49200
gactgcacaa	taactcgttc	ttaactcttg	ttttctcttc	agcactgtgg	cagaataagag	49260
atcctaaaaa	ccttcacagc	acaaaacatc	tttttaaaaa	tataaaaaaa	tacaaaaata	49320
actctgaaat	caatagaaga	cacatggtga	aaccaaaatt	ctagaatata	gggagaataa	49380
aggcattttc	agatattaca	aaaacagaaa	attgatcatt	gctgaagtaa	tttctaagaa	49440
atgtacttga	gggagaagaa	aaatgttcca	aagaaaagta	tctgtgatac	aagaaggaa	49500
ggaaagtga	gaatgggtta	acaggtagat	aaagotata	aatgttgacc	tagaaaaata	49560
caaaaaaact	agcaataatg	tctcgttggg	aggggtgaag	taaaaatata	attaaggcca	49620
aalgtaggg	aagtggaaig	aaagaaltag	aagtccctgc	cllgltcaca	ggactgalla	49680
ataaatagag	ccaggttttc	cattcaaaaa	gttaaaactt	gaacaaaaata	aactcaaat	49740
aagtgaagag	ataaaaaaaa	gaatttaantg	tcatagaaaa	ataaaaaato	antagaatta	49800
atcaataaat	cctggttta	aaaagctgg	tctttgaaag	gattaataaa	ataatcatta	49860
agcaagctctg	atcaaaaaaa	aagagaaaag	gtacaaaaaa	aagtactgta	tcagaaagag	49920

-continued

aacatacaga	tacatacaga	tatgtaagag	tctgttttct	tacaccagaa	tactatatac	49980
aacattatgc	tagcatatat	taaatttcaa	taatgttaat	gattttctag	gaaaacagaa	50040
aattattaat	ttaatttgaa	gaacacagaa	aactgagaaa	aataaatgat	catgaaaaaa	50100
atgaaaaggt	aattaaatac	tgatattaac	tgcctaaaaa	acaccagcag	cagccagggc	50160
agctgcagtg	caagttctgc	caaacttgag	ggaacagata	attcttctat	tccagagcat	50220
agaaaatgat	ggaaagtctc	ccaatttaat	cagagaggac	agcctgatcc	ttgttatgaa	50280
cacagataaa	aatggggtaa	actatatgcc	aaactcagat	acaaaaaccc	taaataagat	50340
gctagcttat	tgtatgtgaac	aatccaaaag	tgcatttttaa	attagccacg	ggtttttagag	50400
aaagaaaaac	tagcaatgtg	accaccaact	atgttaacaa	ttttaagacg	aaaatctaca	50460
tgatcatatc	aatgcatact	acacaaaagc	atttggggcaa	aaaaccacaac	accacccott	50520
gacttttttaa	actcttagta	attaggcata	aacagaaatg	tacttaattg	gatagaatac	50580
actcggtgaa	gatacacagag	gaatgtctcc	taaaaccaaag	ccaaagacaa	agattcctat	50640
ttaacctcaa	tagtcaaacac	tgcagcgaga	glaattctatg	gaagacaagg	aaaaaagtaa	50700
aaacatgaga	gacatctggt	gtttaacaga	caataagatc	acctacttgg	aagaggcaaa	50760
cgaatacaga	gaaaaactat	taaaactgag	acagggttta	gtatggaggc	tcaggttcag	50820
ctgtagtttg	ggctaccaaa	tccaactcgc	ttgcttggag	agttaatcct	gcaagcttaa	50880
tttctgttga	ggtattagga	ttgacaagcc	tgtgctcttc	cctctctccc	catcttcaac	50940
actgaaataa	cacgggtggt	ggaactggat	aacagaatct	tccaaaaaca	aaaallgtcc	51000
tgaaggcgctg	acttgtgccc	ttaactcaaaa	aacactttat	ctgtgcctcg	cagctcctac	51060
agttgtctgt	ggataagcct	gccaaccaagc	tccggcgtat	tcttccctgca	gagggcaagg	51120
aagagcaact	tcacagggaaa	atttttttcc	gaactgtatg	cgcgttatta	cataaaacta	51180
cgtgctggca	aatggagctc	cagcaaaaata	agatattcag	agtcacaaact	ccttaggaaa	51240
aaaaaaaaaa	aaaagcaagc	acataaacct	aatttccttg	catgggcact	ggggagggag	51300
gtcgttaact	cgcacagccc	gcaggctcgc	accacccggga	aacccacggg	caccgcgcgc	51360
tgcctcaggg	ccttcacagt	gcacatggcc	ggggcgcccc	agctgacccc	ggatgcgcag	51420
ccctagccct	tccctctgta	cccccggccag	gaaggggcgg	gagcgcgccg	gacgcgcagg	51480
cggaagggct	tctcgttccct	ctgcacacag	cagcacccccc	aaggcaccaac	agggaggggtg	51540
cgggagggctc	ccgagaccca	ggagccggggg	cggggcgctgc	cgcgcgaccc	gtcccactgc	51600
ggcgagggct	ggggctgcct	ccagggcgcg	agctgtcggg	agccacctgg	ctctcagttc	51660
cgggtccctg	cgacaacccct	cgggcgccga	ggggaggagg	cggccacctg	cgcctgccac	51720
ctcgccgccc	ggctccaccc	ctccggggccg	ggcaggacag	gccaaggacgt	ccctcctggg	51780
ctcgggacag	gacacgcgac	gagggggaccg	gggccccccg	ggcgaaagag	cagcacgcct	51840
tcccagaaaag	cgagtcacgt	gccccacaga	cggactgcgg	gacccccggg	ctcgcccgcc	51900
catcccttca	gaccacgcgg	ctgaggcgca	aagagccggc	cggccggcgcg	gctggcgcgcg	51960
cggctagtac	tcacccggcc	cgcctggtca	gcgcagcccg	aacccccaga	ggccacggct	52020
cggggcgctc	actgatgctc	aggagaggga	cccgcgctcc	gacggcgccct	ccagccatcg	52080
ccgcacgggg	cgagagcgga	gcgcgcgggg	gctcgtctggg	agatgtagta	cccggaacgc	52140
cgcctgcgcc	gtcctccttc	agccggcggg	cggggggccc	ctctctccca	gctctcaagt	52200

-continued

tctctctctc	ctatctgtctc	atctctctggt	cgcacataat	cgatgttttg	gcgtcccaag	52260
ccagatgttg	acccacattc	cgcacctac	acgttgaggt	ttctaaaggt	ggcgcccgga	52320
ccagcagctt	cagcctcctc	tgggaacttg	agaaaatgca	gattctccgt	ccacccagc	52380
ctattcggtt	tttctctgac	taaaacccatg	anggtggggc	ccagcagtc	acattctcgc	52440
aaagccgtca	agtgattctg	aggcgccctc	cagtttgaga	gctatgtcca	cgccctcacc	52500
tccgccccgc	aaggagcccg	gtcttgccctg	tggcgctagc	cgcacacgga	cacctcatcc	52560
tgcggggccc	gccccccgc	tgcaccccca	cgcacccaaag	cctcctccgg	gatgcagcgg	52620
aggcgccctg	aagtcggcaa	ggtcaacatc	ccctccagca	tcttccctac	cctcacgggt	52680
cctcctccag	gggtgcctca	tggccagggg	ttagaaagag	ccaactgtgt	tcttgacatg	52740
gaagtggcct	aagaccttaa	tgaaaactgc	aggagtggaa	tgacagaacc	tttggtcata	52800
cttgaggcgc	tgaagctcaa	atgaggagga	aggaaggat	ccaggagaga	taaccaacc	52860
tggcaagtgt	tggcgcccg	gtagaggggc	gagcctaggg	tagcgtttct	cgaacagggc	52920
cgtgtgttgc	cctccctcgc	gcccccgcta	catttgggga	ggtctggaga	catttttggc	52980
tgtcctgatg	cgggagttgc	tactgttgc	taagtgggta	gacacgaggg	tgctcctcaa	53040
cctcctcact	gaaggacagg	actgcaccc	aaggaaagat	gatccggccc	caataaagaa	53100
accctgggct	ggtcagcaac	aacccctttg	ttctgagaag	agaggaggaa	agataaaaa	53160
aagtggggtg	aagtttttgt	ttggtagagg	aaacttgaa	acattttcac	tggaaggaga	53220
gagaggaaga	ggagggagat	gtctglaagg	acgagcaaac	cgggtgacag	ctgattttcc	53280
cattattgaag	taattagctc	tagttataat	aaattcccaa	taaaaaacca	gtttatccct	53340
gcataaaact	tgtctttttt	ttttaaatat	actgcttgat	tctgtttgct	aattattttat	53400
ttacaggctt	tgcattgata	tgcaaaaatg	agatgggcaa	taattttctt	tttgaattgc	53460
taattgttgt	tgggttcaga	atcaatgtta	tgtctacatc	ataaaaaatt	tggaaccgag	53520
gcaggaggag	tgtttgaggc	cagaagtctg	agacagctct	aggaaacaca	gtgagacccc	53580
cccatctcta	caaaaaaaaa	aaaagaaaaa	aaattgggca	tggtttgctt	ttccttttac	53640
tctgaacaat	ttaaaggaca	ttaaaatttat	ctattctttg	agggttgatc	atttcacagt	53700
taaaaatggt	cctccacagc	tgatgcttct	tttggggagg	gtaaatcttt	taaggctaga	53760
aaagtctctt	ctgtggcaat	tttatatttt	acattttaaa	aattattcta	gagttaaatt	53820
tgataaagca	tgtattttct	aaaacaaatt	atcctttttt	tccagatggt	caagtgtatt	53880
tgataaaagt	tgaggaaagt	agtcttttgt	gaattcttta	actctcccca	aatatcttat	53940
tttgtgtatt	tttgtctctt	tatttttgta	acttttaaaa	gtgtattttt	ttttcaaga	54000
alcagctctt	aggtttatgt	ttttggltat	acgtggagct	ttttctctct	ctttttaaaa	54060
tattttttct	cctttatctt	tttagcgtat	tttgatctaa	cgtaatcgga	agaaggtaaa	54120
ttagaatctt	ttgttaactat	tgtgttttta	tttctcctta	ttctcttgaa	gtcctgcttt	54180
alaaatagla	ccatglllat	tgtgcala	taattoattg	ctttatattc	ttgggaattt	54240
tcccactcca	tcataaaaatg	acctcctctg	tctcatttaa	tgtgttcaaa	ccttgccctg	54300
aattttaact	tgtctgatat	tttaacatcc	tgttgaaatt	tgtttgttac	cccaaacacc	54360
ccttgctggt	ttcgtctttt	ctgaacccct	tatttttaggt	aatcccttga	attagagcac	54420
taagttttgc	tttgtgatta	aacttgaaaa	tctttatctt	gcatagatg	agttgagccc	54480

-continued

tattcatgtg acagctatat tatgctgttt catagccctt ttggtccttt tttaactott	54540
gcattgcata ttttggtlitt attgltgttt ggtlilcttc tgataatttg gaaggtllgt	54600
atthttatct agggagttgc cttataatca tactccgcaa taacacatcgt cctcagtttc	54660
ttcagactgt ctgttaactc cctattctga ataaaaatga cattytaatt tccctctttt	54720
tlctttaccc cttttcttct cctcacctaa tglaaatgat ttlatccttc tttagtattt	54780
gcctttttta ttaactacat ttataaatat ctttactact tgatttttaa atcagctttg	54840
aatgagatat ttggtttcct agatataaaa gatgttaatt ataccatttc acggttagta	54900
ggtttataaa atcacacatt ctgctgtgta accataatcc caggtttgtt ttagtctcac	54960
tcctacagtt aaaagattca gaagtattat taacagttat ttggccatag tttttccccc	55020
aaccattttt tgytgaagt atgatcctgc tttagtittct taagaataat ttatagagca	55080
gagtgtgtgt gctcacgttt gtaatccag cactttggga gacaagaggt agaaggatcg	55140
cttgaagcca gcagttcaag accacccctga gcaacatagt gagaccttgc ctctacaaaa	55200
aattttaaaa tttagccaga cgtaglggag tglgootata glccagagca ctcaggagggc	55260
tgaggcaaga ggtttgctag agccacagaag tttagggctg cagtgacctc tgattgtgac	55320
actgcacccc agtctgggca agaaagttag aacctatctc ttttaataaa caataataac	55380
ttatgaaaat tatattccct gagtttttca tgtttaaaaa tatattgttc ctttatcctg	55440
taaaagtttg agtataaatt cttgggttat actttattta ttgaagaatg tataagtatt	55500
glctctaga altgagtgtt gctglaatga aaccagaagl cagcctggll tattttcccl	55560
cagaatagag gtaattgccc gccggacacc gtggctcatg cctgtaatcc caacactttg	55620
ggaggccgag acaggttgat caccaggtca ggagattgag aacctcctgg ctacacatggt	55680
gaaccccccg ctctactaaa agtacaataa gttagctggg catggtggty gacgcctga	55740
atcccagcta cccgggaggc tgaggcagga gaatggcctg aacctgggag gaggagcttg	55800
cagagagctg agatccggcc actgcactcc agcctgggag acagagttag actccgtatc	55860
aaaaaaaaaa aaaaaaaaaa aagaagtga gtaattgcca tgatgtctca agaattatct	55920
ctttgtctat gaataccaga aatctcactg ttatacattt tggaaattatt attctgggac	55980
aatttttctt gggacacaaat agattgaact tatagattta attttttttt tttttttgag	56040
acagagtctc actgcaatct cagcttactg caacctctgc ctccagggtt caagcaatcc	56100
tcctgctcca gccctcccaag tagctgggac tacaggccggc tggccacctg cctggcctat	56160
ttttgtcttt tttagtagaga cagggtttca ccatgttggc caggctgggc ttgaacgcct	56220
aacctcaagt gatccacctg cctcagcctc ccaaaagtgt gggattacag gcgtgagcca	56280
ccatgccag cctcaattcc tcttctctc ttglaatttt tctgaagtlg aaacacattg	56340
ttctaatacg ttatttcagt gttcttctaa gatgtgtaaa gcacctatt cccaggtcac	56400
cccccatctt gctagtgcag tcggctgggt cttcacaaaga gctctggttt tctcctgctt	56460
aalctcaagt acctctgcca gccctccact gglllatgal tlggagtttl ttggtttllg	56520
ttttttgttt ttgacagagt cttactctgt caccacaggct ggagagcagt ggcataatct	56580
cagctcactg caacctctgt ctcccagggt tgaggagatc tccgtcccca gccctactgag	56640
tagctgggat tacaggccgc tgcacaccaca cccggctaatt ttttgatttt tttagtagaga	56700
tggggtttca ccatgttggc cagggtgggc ttgaactcct gaacctcagg taaccaactg	56760

-continued

<hr/>	
cctcagcctc ccaaagtgcg gagattacag gcgtgagcca ccgcgcctgg catggtttgg	56820
agttttaalc tglagtllla ataaagatag tgccttatgtt tglgtttcctt atatttcltg	56880
gtactettgg gtaatttgta agatccocat atctacacaa gaagtccatt ttcaattctt	56940
ttcttcagac tgtttatattt attttatattt attttatattt tatgtttgag atggagtcct	57000
gcgtgtgcac ttctggaggg tggagtgacg tggcgcgatc tcaggtcact gcaacctccg	57060
tctccgggtt tcaagcaatt ctctcgctc agcctcccca gtagctggga ttacaggcac	57120
ctgccaattt ttaatttttt tagagacaga gtctcgcttt gttgacgagg ctggagtgcg	57180
gtggtgcaat catggctgac tataacctcc aaatccctggg ctcaagtgat cctcctgcct	57240
cagcctcctg agtagctggg actacaggca catgccacca tgcccagtta attttaattt	57300
ttttgtagag acagggctct catalgttgc ccaggctggc ctctactcct tggcctcaag	57360
taatctctct acctcagcct cccaaattac taggattata agcatgagcc acctgcccc	57420
gccttgttct actactttaa ttctatattg taggtgacca tgtaattgat catcctcaac	57480
aggalactgt aagaatgaaa gaggtcgaca glaglatgat gctgggacta gaattgtgca	57540
ctgagattat ttctgggaaa gcaggagata cgtccacctt acttatagtg tgcttgcctt	57600
tggattgttg aatttggagt ttctattttgc aggccttattt caactgggca gccttgatcc	57660
gcctgcacca gcaattgctac cgtctctctc accgggtctc tgggacctct tcagtcacta	57720
tacttagctc agttccccc cctcccactc cctaaaagcg taaccaggaa tcttgcctca	57780
ggctactcgc cgtctccgtt gggctglltc agttctattt acccagagtc aaactccag	57840
cattccctac ctgattccag acttggagtc cagagcttta acctcttcag gccaaactcc	57900
caatttgcat ttctgctcct atatcttagt ccatggagat acatttcatg totttgagtc	57960
tacttcaaaa gtaaattttg ctgtttttta attttttttt tgagatggag tottgccctg	58020
tcaccagggc tgtggtgcaa tgacgcctac tcggctcact gcaacctccg cctcctgggt	58080
tcagcgattt catctgcctc agcctcccaa gtacgtgtga ttacagacag gccaccacac	58140
gccagctaa ttttttttat ctttttagtag agacagggtt tcacctgttt ggcagagctg	58200
gtcttgcaat cctgacctcg tgactctgccc atctgggctt cccaagtgc tgagattaca	58260
ggcgtgagcc actgtgccc gccaattttg ctttttttat atttctttgc tatatgttta	58320
gaggataagt ttacagtgcct atatgcattc ccaaatatta gacaaaaaa atctccaaaa	58380
aattagaag aaaaaccaaa aaatctcaaa aaataccaaa aagcaacaat ctccagagcc	58440
atctcactg accccaata aaataaaatt agaaattaac ccaacttaa caaataaag	58500
tactcaagtc agagaggaaa gaggaataaa acatcaaaat tacaaagtct aggcgggtgc	58560
tcacgcctgt aatccagca ctttgggagg ccaaggcggg cagatcacia ggcaggaat	58620
tcagaccag cctggccaat atggtgaac ccggtttcca ctaaaaatac aaaaattagc	58680
caggcatagt gatgtgtgc tgtaatccag ccacttggga ggtgaggca ggagaatccc	58740
tgaacccagg gagacgaaga ttgcagtgag ccaaaalagt gccactgcac ttgcgcclgg	58800
gtgacaaagc gagactccat ctcaaaaaaa aaaaaattac aaactcttta gatagaaatt	58860
ttggtgtttt ttttttgagc ggagctctcc ctgtctgcag aggcgggagt gcagtgggac	58920
tatgtcagct caccgcaccc tccatctcct ggattcaagc aattctcctg tctcagcctc	58980
ccaagttagt aggattacag gcgcacca ccaagcccag ctagttttta tatttttagt	59040

-continued

agagatggtg	tttcaccatg	ttggccaggc	tgggtotcaa	ctoctgacct	caagtgatcc	59100
acctgcttca	gccttccaaa	gtgtctcagat	tacaggcggtg	agccaccgca	ccccaccclag	59160
atagaaattt	caacatgagg	cggggcacaa	tggctcacgc	ctgtaattctc	agcaotttcag	59220
gaggctgagg	cgtggggagg	tcaattgggc	ccaggagttc	aggaccagga	tgggtgacag	59280
agacagaccc	tgtctctatt	tatttgaaaa	aaaaaaaaaa	aaagagagag	agaaagaaat	59340
ttcaacatga	aaagtatctc	tcaaacacct	cgagatggtg	gcacaaaagcg	actcaaaagg	59400
aaatgtatta	ctgtgtgtga	atgtgtgtga	aaataagaaa	gaggccgggt	gtgtgtggcta	59460
acacctgtaa	tcccaaacct	ctgggagtc	gaatcaagtg	gatcatgagg	tcaggagatc	59520
gagaccatcc	tgggtaacat	ggtgaaaccc	tgtctctact	aaaaatacaa	aaaattagct	59580
aggcggggtg	gctcatgoot	gtaatccag	caatttggga	ggctgaggga	ggtggatcac	59640
ctgaggctcag	gggtttgaga	ccagcctggc	ctacatgggt	aaacctcgct	tcttctacaa	59700
atcaaaaaat	tagctggggg	tgggtgtggg	tgcctgtaat	ccagctact	cagaggctga	59760
ggcaggagaa	tgccttgaac	cggggaggcg	gagggttgcg	tgagccgaga	tgcacacact	59820
acactccagc	ctgggcaaca	gcctgggtga	cacagtgaga	ctccatctca	aaaaatacaa	59880
aaaattagct	gggtgtgtgg	gcctgagcct	gtagtccag	ctaccgggga	gggtgaggca	59940
ggagaatgga	gtgaacctgg	gaggaggagc	ttgcagtgag	ccgagatccc	accactgcac	60000
tcacagcctg	gcgacagagc	aagactcttg	tctcaaaaaa	aagaaaaaaa	aaggaaaaaa	60060
gaacctgat	aataaagaaa	ccaaaagtlc	aaacttcaaa	gctcggacac	ttlaaagaaa	60120
taattaataa	aggcagaagt	taaaggagg	atgataaagc	aatttttttt	gttgggttttt	60180
ttgagatgga	gtcttgcct	gtcaccacag	ctggagtgca	gtgatgcgat	cttggtctcac	60240
tgcacacctc	gcctcccggt	ttcaagcaat	tctcctgcct	cagcctcctg	agtagcttgg	60300
actacagggtg	gcgcgccact	ggcccagcta	atttttgtat	ttttattaga	gacgggggtt	60360
caactatatt	gttaggttg	tctnaaacct	ctgatctcag	gtaattctgac	caactctggc	60420
tctcaaatg	ctggggttac	aggcaggcgc	caccgcgcct	ggcctaagag	aaaattattg	60480
ttctgtgcac	aaggtaata	aaagagacac	acgtttacaa	atggagacca	gcacccattc	60540
agctcagtgt	gtctggagaa	aaacaaatct	cgttccagaa	ttcaatgatta	cgcagccatt	60600
tttgcctcct	aaaaatccta	ctatgttgct	gttgaccatt	ctctctcttt	ctctctctct	60660
tgtttctct	ccagaaagc	tattcagaca	ttctcctctt	tcttcaaac	tccaacactt	60720
ctcctccat	ccttagcctc	agctgctgac	ctcacttcta	atcatttgaga	aaacaggaga	60780
agcatttaag	agtgaaacct	cgcctcccg	cacgggcaca	accaccacc	cacagaattg	60840
tgcccaatt	ctgcgctc	tctctcacc	atggatggac	ggtccaggct	ccgagccaaa	60900
gcccaggctc	ccctggagct	ctggatccac	caactgcagc	ttctcaggca	gggcccacgc	60960
agctccctgt	ctcccttgta	ccatcaatcc	ctccctccac	tgggtcactc	ccaaacatat	61020
alatattllag	tgatgtllct	cccatgtgg	aaaatcaatt	agcctctctc	ctcccccagc	61080
tactatccta	tttgtttctt	tccattctct	gcacaaactc	tcaaacatt	gtgtctatgt	61140
gctgaactca	tttatctctt	cccgctctct	gctgagctct	tcccacagac	tctccaccca	61200
gttactccat	gaaatgaact	ctgcactgac	acatccaatg	gtgaatgttc	agttcttaat	61260
tttattcagt	cttccagcag	catttgacct	ggccgatcac	tccctctctt	taaaaatact	61320

-continued

tttttcagcc	aggcgtgatg	gtcacacct	gtaatccaa	cactttggga	ggccaaaggc	61380
ggaggatcat	gagagccag	gagttcaaga	tcagcctggg	caacatggca	agaccctatc	61440
tctacaaaaa	ctaaaaagta	gccagtgtga	tggcatgcac	ctgtagtccc	atctacttag	61500
gaggctgagg	cagtaggatg	acttgagcct	gggaatcaa	ggctgcagtg	agccatgatt	61560
gcaccactgc	actccagcct	gagtgacagc	gagacccctgt	ctcaaaaaaga	caaaatagga	61620
aactttttctc	agcatattcc	tctgattctc	ctgctgcttc	tgtctgcaca	gattcagttc	61680
ccctttgcogg	ttcttctctca	ttctctctgat	ctcttgacct	tgaagtgcgc	cagagtacag	61740
ttctttttttt	tttttttgag	acgcagttctc	gtctgtccac	caagctggag	tgcattggcg	61800
aggctctcagc	tcattgcaacc	tctgcctcct	gggttcgaagc	gattctcctg	cctcagcctc	61860
ccaagtagcc	aggactacag	gcacatgccca	ccatgccccag	caaattgttg	tatttttagt	61920
agagacaggg	ttttactata	ttggccacgc	tggctctcaa	ctcctgaact	cgtgaaccac	61980
ccgcctcggc	ctcccaaaagt	gctgagatta	caggcatgag	ccaccacacc	cggcccgagag	62040
tacagtccttt	agacggcctc	tctacctata	cttgctcccc	tcataaaactc	ctctcgcctc	62100
atggctttta	ataccatcgg	tagactgatg	actcccatat	ttctcttttt	tttttgaga	62160
cggagtctcg	ctcagtcacc	caggctggag	tgcagtgccg	cgatctcggc	tcactgcacg	62220
ctccacctgc	caagttcaca	ccattctcct	acctcagcct	ctccagtagc	tgggactaca	62280
ggcaccgcc	accacgcctg	gctaattttt	ttgtattttt	agtagagatg	gggtttccac	62340
atgttagcca	ggatggtctc	gatctcctga	ctcctgtgat	cgcccatctc	ggcctcccaa	62400
agtgtctggga	ttatagtggt	gagccacccg	gcccagccga	tgaactccat	attctctatc	62460
cttgctgtgt	gggagttctc	ctcagaactc	catactcata	aatccaaactc	tcataaatag	62520
tatctcaaat	gggcaatatg	ctcaaaagtc	aattcctact	ttttctcccta	aacttgcttt	62580
cctgcagtct	ccaccatctt	aatgtccaat	ctaaacattag	gaggcaaaaa	ctttgaagtc	62640
attcttgact	ctttctctat	acacacccta	tccaattttt	ctgcagatcc	agtcgacccc	62700
caaatccagt	tagctctcat	catctccct	gttaccacct	ggtccaggcc	atcttctctc	62760
ctcacctgaa	tcactgcagc	attctctctca	ctggtctctt	tgggtctggt	ttcacctccag	62820
cttagcatag	tctccacaaga	gcagtcagag	ggatcctttt	aaagtgtaat	tcccatctcg	62880
tcctgtctct	gctcaaaacc	ctgtctgtgat	ctccgtttta	atctgtcaga	ttaaaagcca	62940
gagtctttcc	agtgacctac	atgatctgcc	tattatccac	tcacccttct	ttccctttgc	63000
tcactccact	ccagctctgc	agctgtcctt	tctgtttcct	gaacagccca	gattttgctt	63060
ctttagaacc	tttgtatttg	ctgtccctc	tgtctggaat	gtttttccag	gaagtcacct	63120
ggctctctcc	tgcacttctc	tctgaccac	catgtttaaa	aatcaactca	acacacttca	63180
ggccggacat	ggtggctcac	gcctgttaac	ccagcacttt	gggaggccaa	ggtgggtgga	63240
tcacctgagg	tcaggagttc	gagaccagcc	tggccaaacat	ggtgaaactt	cgtctctact	63300
acaaatacaa	atagtagcca	ggtgtagtgg	cacacacctg	taatctcagc	taactaggag	63360
gctgaggcag	gagaatcgtc	tgaaccacga	aggcagaggga	ggtgcagtgga	gccaaagatca	63420
cgcacacaaca	cccccagcctg	ggtgacagag	caagacccca	tctcaaaaaa	aaaaaaagga	63480
aaaaaaatca	cacaaacaca	cttctcttca	tattcctttt	ccaagtttta	ttttctccca	63540
gaataacttta	cattgtttta	atggaagtto	tcctgttccc	cccaactaga	atggataactt	63600

-continued

cctgcagcta	ggcactctag	tctctccatc	caagtactaa	ccaggtccaa	ccctgcttag	63660
cttctgagag	caggggagag	caggccctgt	cagggtggta	tggcccagga	attttgattc	63720
tgttttattc	attgctgttc	tgtagattct	cttttgttcc	tctctctagt	gttgagaaca	63780
ctacttgtac	ataataagaa	ttaataaant	atttgttgaa	tgaatgaact	gttgaatgaa	63840
ttaatctcag	aaatgcagga	ctggctctac	attagaaaaa	ttttcaaggt	cattctctgt	63900
tgctgtaaca	cattaagaga	ggaaaaat	gtactctaaa	tcatttgata	aaataacatac	63960
tgattttctg	tttcaaaaaa	tcttagtggc	tggcgaggt	ggctcacatc	tataatccca	64020
gcattttggg	aggacgaggt	ggcggtctca	cttgaggtca	ggagtttgag	accagcctgg	64080
ccatcatggt	gaaccctcat	ctctactgaa	aatagaaaaa	ttagccgggt	gtggtggcgc	64140
atgctgttag	tcccagctac	ctgggaggct	gaggoaggag	aatggcttga	accogggagg	64200
cggaggttgc	agttagccaa	gacatgcca	ttgcactcca	gcctgggtaa	cagagtggaa	64260
ctccatctca	aaagaaaact	cttagtgagt	ttaggaatcc	aagggaagac	ctcaaaactaa	64320
alagataatc	tagctaccag	aagccttcag	taaaacttaa	cactccatgg	tgaacattta	64380
gaacattctc	tactaaaaaa	caggctaaga	atgctgtcaa	tcttcacggc	tagtccaaag	64440
agtcnaaaag	aagaaatgag	cgtctgattta	aaaaaatata	caaacnaaaa	actaacgagt	64500
cagaggtctg	cagcaaggac	tgaaggactg	tacagtactt	gcctggagca	ggcggatggc	64560
cacacccctg	cgaagcctgc	tcaactggct	gggggacgct	ccagtgtgtg	agtggcagga	64620
tgaggggtac	ttcctctgcc	aggagglg	actggggaga	tcctccccc	ctcacacttt	64680
ggcagctggg	gctttggaat	gtgacttagc	ttctgtcaaa	gggtcaatcc	accctttgat	64740
atatgatgca	aaggcgacaa	tatgatgcaa	agtgagagga	acagccnaaa	ttaggacttt	64800
taccacagct	gtggaggtgg	acagcgacag	tggtagggcc	tggccagact	tttcatgctc	64860
aaaggtggtg	gttgtctctc	ctactctctg	tccctccagg	gcttctcttg	cctgtgtgct	64920
gaacctgctt	cttttaattt	tttttaactt	tttttaattt	ttaatgtttt	taattaaaaa	64980
aaattttgaa	aactgtctga	acctgctttt	gaacctgctt	atgatttgaa	tgtttgtccc	65040
ctgcnaaact	gattttgaaa	cttaactctc	aaagtggcaa	tattgagatg	gggctttaag	65100
cagtgaactg	atcatgagag	ctctgaactc	atgagtggat	taattggatta	atgagttgtc	65160
atggagatgg	catcagtggc	tttataagag	gaagaattaa	gaacctgagct	agcatggtcg	65220
ccctctcacc	atttgatata	ttcactgccc	taggggctct	gcagagagtc	cccacnaaaa	65280
agaaggctct	caccagatac	agctcctcaa	ccttgtactt	ctcagcctct	gtaactgtaa	65340
gaataaaatg	ccttttcttt	atgaattacc	cagtttccaga	tattctgtta	taaaccaatag	65400
aaaacgaact	aaggcaaaat	ctcatgattc	tactgcatg	ccattccaat	aaactccctt	65460
tatgcttaag	agagccagag	ttggccaggc	gtggtgactc	acgcctgtaa	ttccagcaact	65520
ttgggagggc	gaggcaggtg	gatcacaagg	tcaggagatc	gagaccatcc	tggctaaacc	65580
ggtgaaaccc	cgctctcact	aaaaalacaa	aaaaattlagc	tgggcgtggg	agtgggtggc	65640
tgtagtccca	gctactcggg	aggctgaagc	aggaggagaa	tggcgtggac	ccaggaggcg	65700
gagcttgcaag	tgnatgagaa	tngtgcaact	gaactccagc	ctgggtgaca	gaatgagact	65760
ccgtctcaaa	aaaaaagaga	gccagagttt	atttctgttg	cttgcaacca	agaaatctgg	65820
ctggtgcact	gaagtctcca	taataaatag	caatttaaaag	actctttcca	agccaggcaa	65880

-continued

tgcctagcct	tgtttagtcc	ttgttggaat	acattcattc	attcatttgt	tcaaccaact	65940
gtgclccaga	gactaagaal	acaaaatagg	gggcgggtg	tggtagctca	cacctalaat	66000
cctagcacct	tgggaggcog	aggcaggtag	atcacctgag	gtcaggagtt	cgagaccac	66060
ctggccaaaa	tgggtgaaac	cctactctac	taaaaataga	aaaaattago	tgggggtggt	66120
ggcggacacc	tgtaatccca	gctactcgtg	agactgaggc	aggagaatca	cttgaacccg	66180
ggaggcagag	gttcagctga	gccagatcgc	caccactgca	ctccagcctg	ggcaacaaag	66240
gcgaaactcc	acctcgaaaa	aaaaaaaaaa	aaaaaaagag	ggcgggggt	gggcgcagtg	66300
gctcacgcct	gtaatccag	cactctggga	ggccaaggca	ggagaattac	gaggtcagca	66360
gatcgagacc	agcctgacca	acatggtgaa	accccattct	tactaaaaat	acaaaaatta	66420
tcggggcgtg	gtggcgcaaa	cctctagtcc	cagctacttg	ggaggctgag	gcaggagaa	66480
cgcttgaaac	cgggaggcag	aggttgcagt	gagccgaaat	catgccactg	cactccagcc	66540
tgggtgacag	agtgagactc	cgtctcaaaa	aaaaaatata	aaaaaaaaaa	gaattcaaaa	66600
attgtagagt	tatagtgtgc	ttctagttta	gttgagagga	catctgtcct	tcaagggaag	66660
ctagaaatcta	taccctgagt	ccttactgaa	atcaatccag	cagtcanaac	atgggaccaa	66720
cgtatcagcg	agtaagctag	gaagagcacc	tttgtacatt	tagctcatgt	tgagataaag	66780
cactgcagag	gctgaaggaa	gctcacagtt	ctggggtcca	tcctttggca	tttaaaaaag	66840
aaagtgtcaa	gaaaattcgg	ttggtcacgg	tggctcacgc	ctgtaatccc	aaacctttga	66900
gaggccaaag	caggcgagac	acgaggctcag	gagttcgaaa	ccagcctggc	caacatgggt	66960
aaaocccgtc	ttactataaa	acagaaaaat	tagccgggca	tggtagcgca	tgctataaat	67020
cccagctact	caggaggctg	aggcagagag	attgcttgaa	cccgggaggg	ggagggtgca	67080
gcagtgagag	gcaggccact	gcactccagc	ctggggagaca	gagcaagact	ctgtctcaaa	67140
aaaaaaaaag	aaaaaaaaag	agaaaggaaa	aaaagaaaag	aaaaaaaaag	aaaaagaaaa	67200
ttcaggccag	gcccaggcctg	gtggctcaaa	cctgtaatcc	caacactttg	ggaggctgaa	67260
gcgagacggg	gccttagacc	aggagtttga	gaccagcctg	agcaacatag	cgagaccctg	67320
ttctataaaa	aaaaaaaaat	tttttggcca	gacgcagtg	ctcacgcctg	taatccagc	67380
actttgggag	gcggaggcag	gtggatccag	aggtaaggag	atggagacca	tcctggctaa	67440
cacgggtgaa	cccactctct	actaaaaaat	acaaaaaat	aacggggcgt	ggtggcgggc	67500
gcctgtatgc	ccagctactc	gggaggctga	ggcaggagaa	tggcgtgaac	ccggggaggc	67560
gagcttgacg	tgagccgaga	ttgcgcact	gcactccaga	ctgggagaga	gtgagactcc	67620
gtctcaaaaa	aaaaaaaaaa	aaaaaaaaat	taattgtcag	gtgtgctggc	atgcagctgt	67680
agtcctagct	actcgggagg	ctgaggtaag	aagatcgctt	gagccagga	gttcaaggct	67740
gcagtaaatg	tgccctctac	ttaccctgg	gtgacaatga	gacctctct	caaaaaagaa	67800
gaaaaaagg	aaagagaana	agaaagaana	aaagaganaa	aaagaaaggaa	gaaagaaana	67860
aaaagaaaag	gaagggaagg	agaaagaaaa	aaaagaaaga	aaagaaagag	agagaagllc	67920
aaagacaaaa	gggtcaggat	cccaaaatag	tttttatgtt	ttatttattt	atttacttat	67980
ttatttttga	gaacgtatgg	ctctgtgcgc	cagggtggag	tgacgtgatg	cgattgcggc	68040
tcactgcagc	ctccaaactg	ggctcagggt	gcccctccc	ctcagcctcc	cgagtagctg	68100
ggaccacagg	cgcgtgcac	catgccagc	taatttttta	attctttgta	gagatgaggt	68160

-continued

ctctatatgc	tgcccaggct	ggtctcgagc	tcctgggctt	aagccatcca	cccgctggg	68220
cccccacaa	tgctgggatl	acagaagtga	gccaccgcgc	ctaalcgggt	gglltglltg	68280
tttattgacg	gggtctcgct	gctgccacgg	ctggagtgcc	agtggctggt	cacagggtga	68340
gtcctggagc	attgcatacg	ctcttgggct	ctagcgatcc	tccagagtag	ctgcagctgg	68400
gattccaggg	gcgccaccgc	gcgggggtca	gaatgggttt	ttatatlgag	ggttatgctg	68460
ccacctagag	gatatattga	gtaccgaact	gtgtgcgcag	ggaggctgag	gttgacgtga	68520
gccaaagtga	tgccaggggc	ctccagcggtg	ggtgacagag	caagatttca	tctcaaaaa	68580
aaaaaaaaa	aaaaaaaaa	aagaattgaa	agtaaggctc	tgaagagata	tttgtgcctg	68640
tatgggtcata	gcagatttaa	ctttgaccca	ctagctaaaa	cacaaaagca	acatgtgtct	68700
gtcagcaggt	gaacggataa	acaaaaatgt	gtatatatgt	acaattgaat	attatctcag	68760
ctttaaaaag	gaataaaaag	ctggatgcgg	gggctcacgc	ctgtaatcct	aacacctttg	68820
gagactgagg	tggttggtatc	accggaggtt	aggagtttga	gaacagcctg	gccaaactgg	68880
tgaaccttca	tctctactaa	aaalactaaa	altagccggg	calggtggca	cttgtctgtg	68940
atccaaagct	ctggggaggg	taaggcagga	gaattgcttg	aactcaggag	ccggaggttg	69000
cagtgcagct	agatggcacc	actgcactcc	agcctgggca	acagagtgag	actccatctc	69060
aaaacaaaca	aacaaaaaat	tattatttcc	aaagaaacaa	gaacctgggt	ccatttccca	69120
gcccacacct	gatgttgact	cacacacac	agcctgggtt	gctatgagcc	tgcttcattt	69180
aatlglcacc	ttaacttacc	alcaccccca	agtcctggaa	taactclttg	ctgacctttg	69240
tgtgtctgag	catctccatg	tcgtccaacg	tgcagtccct	ctcactgcac	tgagtcacaa	69300
gccagacgtg	gtctgactgc	agggtcatcc	tttgtggctt	aggctgactc	gggcatagca	69360
gggtgctctg	agacctcacc	gcataatagg	tttgccccc	ataaactcta	tataaatatt	69420
atattatgtg	gtctgggtgt	gtgtagcttt	gcactgtctt	ctcgtgacag	tgccctcaac	69480
ctctttccca	ggatttcttc	ctctacctcc	tcaagtccca	ctgctctgca	aagacaaaa	69540
gtgcagaggt	cccagctccc	tcctttacac	cccacgacgc	agcctcctct	ctcagaaacc	69600
tttaaacaga	gtcttttact	gcagatccca	agacacgcca	cacccctctc	tccacccccc	69660
tccagacaca	cccaggtaat	tatagcacc	agggtlaact	tgtagatgga	gtccctggaa	69720
catgtggata	gtgccccctg	ggagtatgca	aaagcaacat	tgtgtggcac	tgacagagaa	69780
agggtgacat	ccaggaatca	gagcatgggc	ctctggggag	tagggatgtg	gccagggcag	69840
ctgcaaaaa	ttggtagagc	aaggccacag	gatctttctg	accttccttc	caaacagagg	69900
ctcctgtact	gggtgatccct	gtgttgattg	accactccct	tcctgggggt	cgtggtctct	69960
gtcccagttg	cccggaacttc	tgtagtgltc	clactgaggt	ccctttcatg	agaagcatgc	70020
tgctcctcca	cctgtctggga	gcacagagtga	caacttcaat	actataatag	cagtggcata	70080
cagagagaga	gaanagatga	gtggcaagaa	aaacaggctt	ccagcgagga	gttttctcat	70140
aaaaacaaaa	acgtttacaa	gcacacclll	tataaagggc	tagatagtaa	atatttttag	70200
ctttgagagc	cacatagact	tgtttgcaag	gactcaaatgt	cgcatttgta	gtttgaaagc	70260
agccatcagg	gttatgtaaa	tgagtgagtc	tgatttttgt	tcaagcaaaa	tttattttacc	70320
aaaacagaca	atgagtgagg	tggaatttgg	ccatgatcct	tagtttgcca	actcctgctt	70380
tgggctcacc	cagatctgat	tttgaattct	ggctctgcta	ctggtagct	gcaggagctt	70440

-continued

ggaaggctct	ctgagcctgt	ttoctcatct	gtaaaattaa	agcaataatt	tctaacactc	70500
aagagtggtta	cctcacgcct	gtaatcccag	cactlilggag	gctgaggcag	gcggatcacc	70560
tgaggtcaga	agttcaagac	cagcgtggcc	aacgtggcaa	aaacctgtct	ctactaaaaa	70620
atcaaaaaag	tagccgggna	tgggtggcgc	catctgtaat	ccnagctant	tgggaggctg	70680
aggcagggat	actgctagaa	cctgggaggt	ggagcgtgca	gtgagtgag	atcacacctc	70740
cacactccag	cctggccgac	agagcgagac	tccatctcaa	aaaaaaaaaa	aaaagagctg	70800
ttagaaggtt	ttgagataat	gaataaaaga	tgccttggtg	atactaagta	ttcaaacact	70860
gatagctgca	ttggtctaatt	tataacagtt	tagaagcgat	tgagtcacaa	aatgctggat	70920
ttgtcaggga	ggaactccta	tcaggaggta	gatcttgggc	tgagtcctga	agcaaaagata	70980
ggcattggat	agaggagtig	agagaaacac	ctaggactgt	tattattatt	attcgacacg	71040
gagtcctctg	ctctgtcac	caggctggag	tgcagtggcg	cgatctcggc	tcactgcac	71100
ctctgcctcc	cagggtcaag	cgattctcct	gctcctaag	tagctgagac	tacaggtgtg	71160
tgcaccacac	cccggtcta	ttttatattt	ttagtagaga	cagagtttca	ccatgttggc	71220
catgctggtc	tgaactcct	gaacttcaggt	gatccaccgc	cctcagcctc	ccaaagtgat	71280
ggataaacag	atgtgagcaa	cgcacaccag	ccnagaacca	tttttcaate	cttggctctg	71340
ctttttatta	gctgcaagat	ctcaggcaat	ttattttaacc	tctccaaaga	ctcattttct	71400
cattcacaaa	atgaggcaaa	taataatata	tactatccca	ggttgtcatg	agaattaaat	71460
gcaacatgac	atttaatgaa	atgagaagtc	cctlggacat	taactggcta	aagtatgtgc	71520
tgcacaagga	tatcatttta	ggtggatact	tagcatctca	gaactgatgc	tcacaatgga	71580
atatcattga	aacgcattaa	aattcatttt	aaatgattgt	aggtagtgag	gcaattgaaa	71640
gaagaagaca	agaggactga	ttataatgct	tcaggctcac	tagtctcctt	ttaggaggga	71700
aaaacaattt	caagttaaat	tttaggctct	agatttttac	ccctgctgct	cattagaatc	71760
acccagattg	atgaaatcag	agcccatctg	aggctgtgtt	tttcatctcc	agaatgagag	71820
ctgttgtggg	gattaaagtt	ttgaaaaagt	acatctaaaca	ggtgatcgaa	aatgatagtg	71880
atettattgc	agtgatggtc	attattgttg	ttattattat	actgaaagag	gctttagttt	71940
tctgctccat	aangtgaggg	aattgcaatga	gacatttgct	aagattcctt	ctagctctgt	72000
ttttttgttt	ttgtttttta	gacagagtct	ctgtcgccca	ggctggagtg	caatggcattg	72060
atcttggctc	actgcaacct	ccgcctcccg	ggttcaaatg	atcctcctgt	ctcagcctcc	72120
gaagtagctg	ggactacagg	cacacaccac	catgcccagc	taacttttat	attttttaata	72180
gagggtgggt	ttcaccatat	tggtcaggct	ggtctcaaac	tcctgacctc	aggtagtcca	72240
ccgcctcgg	cctcccaaca	tgtlgggatt	acaggcaatga	gcaactgtgc	ccaaacctct	72300
ctagctttct	tgtacactga	ttctagggtt	ctctgctgaa	atatatttga	gacatcctgg	72360
ataaaagatc	atgcaagagc	tcccaatatg	gtatttaataa	ttgattctgg	aggcttagct	72420
acloctgatg	gattagacat	gaactcaactg	cclclcttat	gtglacaaca	caacaacaca	72480
accaagaaga	gttattctgg	cattccattt	attcagttta	tttacagccc	ttacttccag	72540
cagcaggtta	aagatattgc	caggcgccgg	tgcagtggtc	caagtcctga	atcccaaggac	72600
tttgggaggc	caaggtgggc	ggatcaccaag	gtcaggagtt	tgagaatctg	gcaattcttc	72660
agacttagaa	gcaaccagct	cgataacaca	gtcttgtgtg	ggctctccct	ctgtccctcc	72720

-continued

ctcgtctccc	tcattttctca	tcctgtcccc	tgagactgtg	caccttcaca	tagccctgcc	72780
atgagaccct	catctcaggc	tttgtcttct	gggglactg	aggctaaaca	ctgagtgggc	72840
ctaaaagagg	attgggattt	ggaaagttaga	ttattccaca	gagaacagac	tttgctgatg	72900
atcaggccca	ggttgttaatt	gttgaaaaaa	agagaggatg	catagtctta	tctcatctcc	72960
tagtcaaagt	caaccaccaig	ataaataaga	gtcaaatcct	gagatgtgaa	tgggggacat	73020
ttgagtgtgt	aacctgtaga	agcttgcacc	ttcagacccc	tcaatacccc	tgctccccag	73080
agaaggtctg	ccattgacot	cagcacaggc	aggagccctg	caagatgcca	tttgtcctac	73140
taaaagatgga	cccccccact	ctgtttctag	gtaaaataacc	aaagtcaagt	ctccacacag	73200
ccagagcaag	aaagtacagag	cctgtctacag	gagaaaaatac	cacactggcc	aaaggattca	73260
ctagccctgg	ccactgtgtg	tgggaggaac	cagggaatca	tgtgtgggag	tcaatgttga	73320
agctgttgga	ctgggggtgg	ggtggaatat	aagcctggcc	ctggggagtt	tttcccgttt	73380
gagggccctt	cccccaaacot	caagatccag	tgctatagca	ggagatccca	gagctagtcc	73440
taacagatgg	tcaggattga	acttggccca	gagtaaaatg	aggagtagag	tgcacagaat	73500
ttctcaacat	actattgagg	aagaggtccag	aaggcttaag	gaggtagtgt	aactggaaag	73560
gggtctctgat	ccagacccca	ggagaggggt	cttggccctt	gcataagaaa	gagttcagaa	73620
cgagtcacac	cagtaaaagt	aaagcaattt	tattaaagaa	gaacacagaaa	aatggctact	73680
ccatagagca	gcgacatggg	ctgcttaact	gagtgttctt	atgattattt	cttgattcta	73740
tgctaaacaa	aggggtggat	atttgtgagg	ttlccaggaa	aggggcaggg	attlccagaa	73800
actgatggat	ccccccactt	ttagaccata	tagagttaact	tcctgacgtt	gcoatggcgt	73860
ttgtaaactg	tcattgcccot	ggagggcaatg	tcttttagca	tgttaattgta	ttataatgtg	73920
tataatgagc	agtgaggacg	gccagaggtc	gctttcatca	ccatcttggt	tttggtgggt	73980
tttggccggc	ttctttatca	catcctgttt	tatgagcagg	gtctttatga	ccataaactt	74040
ctcctgcaga	ctctctatct	cctcctgtga	ctaaagaatgc	agcctagcag	gtctcagcct	74100
caattttacca	tggagtcgct	ctgattccaa	tgccctctgac	agcaggaaatg	ttggaattga	74160
attactatgc	aagacotcag	aagccattgg	aggacccagc	cttcatttagg	acactggcct	74220
ctgtgacagg	ctgggtggig	gtaatgtctt	gttggccagt	gtggactgtg	ggagatgcta	74280
ctactgtaag	atatgacaaag	gtttctcttc	aaacaggctg	atccgcttct	tattctctaa	74340
ttccaaagta	ccccccccgc	ctttctcttc	cttttccctc	ttttctgatt	tactacatgc	74400
ccaggcatgc	tacggcccca	gctcacatc	ctttccttat	ttaaaaatgg	actggggctg	74460
ggcgcggtg	ctcatgcctg	taatcccagc	actttgggag	gccgaggcgg	gcggtacatg	74520
aggtcaggag	atcgagacca	tcttggtctaa	cacggigaaa	cccgctctct	actaaaaatg	74580
caaaaacatt	agccaggcgt	ggttgcaagt	gcctgcagtc	ccagcggctc	aggaggtctga	74640
ggcaggagaa	tggcgtgaac	ctgggagggt	gaggttgcaa	tgagccgaga	ttgtgccact	74700
gcactccagc	ctgggtgaca	gagcgagact	ccgtctcaca	aaaaaaaaaa	aaaaaaaaaa	74760
tagctgggca	tgggtggcgg	tgccctgtaat	accagctact	ctggaggcgt	aggcaagaga	74820
atcgtttgaa	cccaagtaggc	ggaaagtgc	gtgagccag	atcttgacac	tgcactccag	74880
ccgtgtgaca	gagtgagact	ctgtctcaaa	aaaaaaaaaa	agaaaaaaa	agacagaaag	74940
aaagagcaca	gacagagtca	caggtatttg	cagtaggaag	ctgtcagggt	agagtgcacg	75000

-continued

gaaatagaaa	gtatatttta	cacttacagc	acatottcgt	ttgattagcc	acatttaaaa	75060
tactgaatag	caacgtgtgg	ctatttagta	ttcaactaaa	tcttggacag	tgaagtccta	75120
aagaatocct	gatacgtcog	geatggtggc	tcacgccttt	aatcccagca	ctttggggagg	75180
caaaggtgga	aggtatcactt	aaggtoagga	gttcgagacc	agcctggcca	acatgggtgaa	75240
acctcgtctc	tactaataat	acaaaaaaa	ttagcogggc	atggtgggtgc	atgcctgttaa	75300
tcccaggtag	ttggggaggct	gaggcaggag	aatagcttga	atccaggagg	cgctgcagtg	75360
agcogagatc	atgcocatgc	actactgcac	tccagccttg	gcacacagag	gagaactgtct	75420
caaaaaaaaa	aaaaaaaaattg	ttgggcgttg	tggctcacgc	ctgtaatccc	agcaactttg	75480
gaggtctgag	gggtgtggatc	acctgggttc	tggagtctga	gaccagcctg	gccaacatgg	75540
tgaaccccca	tctctactaa	aaatacaaaa	attagctggg	cgtggtgggtg	ggcacctgaa	75600
atctcagcta	ctcaggaggc	tgaggcagga	gaatttcttg	aecccaggag	gcagaggttg	75660
cagtgagcca	agatcgggcc	tctgcactcc	atcctgggtg	gcagagcaag	actatgtctc	75720
aaaaaaaaaa	aaaaaaatac	ttgallgtct	ggacallctg	cagaacatca	tatggagaca	75780
ctatgttgac	gacatcatgc	tgattgtaag	caagaaatgg	caagtgttcc	agaaacacag	75840
tcagagacca	tacatgccag	aagggtgagat	ataaacctcta	ctaaagtcca	gtggcctgcc	75900
acactgttga	cattttttaa	cctgctagat	gtttgtgtag	aaaaggattt	aaccttgccc	75960
aaagaggggt	ctggcctttg	tcccagcta	ctggacataa	tctctttaa	ctcttgaat	76020
alcatlctcg	alagaagtat	tttltgtttg	actaggggcc	ttgggcccagc	cagatagcaa	76080
caetgtgac	tgggttgggg	gctttggatc	aggtggcatc	agtgtagcct	cctgagtggc	76140
tagagactag	aatacaaccac	atgggcagac	aacccagctt	acatgatgga	attccaataa	76200
agactttgga	cacaagggtc	tgggtaagct	tctctggttg	gcaatgctct	atactgggaa	76260
accattcttg	actccatagg	gagaggacaa	ctggatatct	tcatttggtg	cctccctggg	76320
ctltgcocct	tgcatttttc	ccttgtctga	ttattattat	tattatgaga	tggaaatctg	76380
ctctgtcacc	caggctggag	tgcagtgtaa	tgatctcaac	tcactgcaac	ctctgcctcc	76440
cgggttcaag	cgatttttct	gtctcggcct	cccgagtagc	tgggaactaca	gatgcatacc	76500
acccacacog	gctaattttt	ttgtattttt	agtagagacg	gggtttcaag	ttagccagga	76560
tgtctctgat	ctcctgacct	catgttcgcg	ctgcctcgcc	ctctcaaatg	gctaggaaat	76620
catgtgtgag	ccaccgcgcc	cagcccccct	ggctgattat	taaagtgtat	ccttgagctg	76680
tagtaaatga	taaccgtgaa	tataacagct	tttagtgagt	tttgtgagca	cttctagcaa	76740
attatcaaac	ctaaggatag	ccttggggac	ccctgaactt	gcagttgggtg	tcagaaataa	76800
gggtgctcat	glgtglacca	tgccctctaa	ttltgtagtt	aattiaactlt	cacaacttta	76860
ttattacogc	ttacaactcaa	tgtttattca	catttatcca	cataccactt	attctagtgc	76920
cttgcatcaa	agactttcta	tctcatgtac	tttattctgc	ttgaagttaa	tcctttaggga	76980
tattcttttt	ttttttttaa	ctltgcacat	acataacttt	attttttatt	tatttttaat	77040
tttgtttatt	tttgtgggtac	gtagttagata	tatgtattta	tggagtacat	gagatgtttt	77100
gatacaggca	tgcnaatgtga	aataagacca	tcatggagaa	tggggtatcc	atcctctcaa	77160
gcaatttato	cttcaagtta	caaacactcc	aattacacto	tttaagttat	tttaaaatgt	77220
acatttaatt	ttgtattgac	tagagtcaact	ctgttgtgct	atcaaatata	attttttttt	77280

-continued

ttttttgagac	agagctctcac	tcagtggtccc	agactgaaag	tgcaagtggca	caagctcggc	77340
tcacttcaaat	ctctgctccc	ctggttcaag	cgactctcct	gctcagcct	cccaacatag	77400
tggtgattaca	ggcacacacc	accatgccc	gctaattttt	atatattttt	agtagagacg	77460
ggttttcgc	atgttggcca	ggctggtctt	gaactcctgg	cctcaaatga	tctgacccac	77520
tcagcctccc	aaagtgtag	gattacaggc	atgagccacc	acacctggcc	aaaatagaa	77580
attcttttagt	gaggtctgct	ggtgacaatt	tttttctttt	ttttgagact	gagctctcgt	77640
gttgtcagct	tggtctggag	tgcaatagca	cgatctcagc	tcactgcaac	ctccacctcc	77700
cggattccag	caattctcct	gctcagcct	cccaagtagc	tgagagatta	caggcaccca	77760
ccaccacacg	cggtcaattt	ttgtattttt	agtagaaatg	ggggttcacc	gtgttgcca	77820
ggctggtctc	gaactcctga	cctcaggtga	tcacccccc	ttggcctccc	aaagtgtctg	77880
gattacaagc	atgagccacc	acgcacagcc	aattttttcc	gtttttgtct	gaaatcttat	77940
tttgtgtcat	ctttgaaata	tatttttgat	ggatataaaa	ttgttggttg	atagttatta	78000
tcattattat	tattattttg	agacagggct	tcactctgtt	gctatgctg	gggtgtaglia	78060
atgtgatctc	ggttcactgc	agacttgacc	tcctagggct	caggtgatct	tcacacctca	78120
gcctccctag	tagctgggac	tacagatgca	tgccaccata	cccaactaat	ttttctattt	78180
tttgttagaga	tgaggctttg	ccacatttcc	caggctgggtc	tctaactcct	gagctctagc	78240
aatccaccca	ccttggtcct	acaaagtgtc	gggcctatgac	tagccagcag	ttacttttta	78300
tagcatattg	aatattttaa	atgaatcttc	tggtatccac	tgtaactgtt	taaaaaatca	78360
gctgtttact	tggtcactct	tttttttttt	ttttttttga	gacagagtct	tgccctgtcg	78420
cccaggctgg	agtgcaagtg	ctgtgatttg	gctcactgca	agctctgcct	cccgggttca	78480
cgcattctct	ctgcctcagc	ctccggagta	gctgggacta	aaggccccc	ccaccacgcc	78540
cggctgattt	ttttgtattt	ttcgtagagt	tggtgtttca	cctgttttag	caggatggct	78600
tcgatctcct	gaactcgtga	tctgtccgcc	tcggcctccc	aaagtgtctg	gattataggc	78660
gtgagccacc	gcgcccagcc	cttttttttt	tttttttttag	acggagtctt	actctgtcat	78720
ctaggctggt	gtacagtggc	gtgatctcag	ctcagtgcaa	cctccacctc	ctgcctcagc	78780
ctgcacata	gctgggattt	caggtgcgta	ccatccagcc	cggctaattt	ttgtattttt	78840
agtagagatg	gggtttcacc	atgttagaca	ggctggtctc	gaactcctgg	cctcaagtga	78900
tctgcctgcc	ccagcctccc	aaagattaca	ggcatgagcc	accgcacccg	gccaaagtgc	78960
actcctttga	aggttaactg	cttccctcac	ccctagcaat	ttttaacaat	ttttcttcat	79020
ttttatttcc	tgaagttttg	ttattaataa	tctgtgtgca	gattttcttg	tatttctttt	79080
gtttgcagtt	catagtgatt	cttgaattag	tgtgttggtt	totgttatca	ccacaggaaa	79140
attgtcagcc	gttagctttt	caaatatttc	cttgctaaat	tctctcttct	ccctcttcgg	79200
tacaattgat	ttgattaaaa	ctaaaaaccg	ggccgggtgc	agtgactcat	gcctgtaatt	79260
ccaacacttt	gagaggctga	ggcagggtga	tcacctaaag	tcaggagttc	aagaccagcc	79320
tgcccaatat	ggtgaaaccc	cgtctctact	aaaaatacaa	aaattaccag	gcattggtgc	79380
acacatttgt	agtcaggagg	ctgaggcagg	agaattgctt	gaattccagg	ggtgggggtt	79440
gcagtgagct	gagatccacc	cactgcagtc	tgccctgggc	gacagagtga	gatgagaatt	79500
tgtctcgaaa	aaaaaagtta	tgaatgtttg	ataaaactata	tttgttagaa	tgtttgttgt	79560

-continued

agaatactat	tcattgattt	ttaaacaaatg	ttagattaaa	ccattcactg	gatttgtgat	79620
aattaactta	ctgattttac	ctcactgatl	tgttgtaatl	aatacaactg	gtataaaaag	79680
actgtgacga	ggcggggcat	ggtggctccc	gcctataatc	ccagcaacttt	gggaggctga	79740
ggcaggcgga	tcacctgagg	tcaggagttc	angaccagcc	tgaccacacat	ggtgnaaccc	79800
catctttact	aaaaatacaa	aattagccgg	tcgttggtgt	gcctgcctgt	aatcccagct	79860
cttcggggagg	ctgtggcagg	agaatcactt	gaaccgggga	ggtggagggt	gcagtgcagc	79920
gatatcgogc	cattgcactc	cagccctggg	aaccagagcg	aaactccgtc	taaaaaaaaa	79980
aaagaaaaaa	aacacataaa	acaaaacaac	actgtgacgg	ttcccaaaaa	ttaggagcat	80040
aattaaagga	actcctgata	aaaattaatt	ttatctttaca	tgtaaaactaa	aatgacttta	80100
tgaagttaat	tcagaaatac	aatgcagggt	attagttttg	cacagctgog	tattcagcct	80160
aatgtaatat	tcttgtttatt	tttaaattct	tcttttaact	ttactcatat	gtggatcatc	80220
aaatttcaaa	agattaatag	acaataactc	tagcagcaag	cttccctaag	catataaaca	80280
ttttaatggg	tgatgattca	gaagglaacc	gaagaatatg	tactgcagag	tatcattcac	80340
ccccatatac	ctgcccgaca	gacatcccat	tttgggaccc	tggtataaatg	tgtgggtgga	80400
gagaaagata	gggnaaagtg	gtataagcaa	atggttttgg	agtctgattg	acagcgattg	80460
aaatcctgtc	tctacctctt	aacagcctca	tgatcctaca	taagttaccc	cgatcctcag	80520
ggccacatct	gtaaattggg	ggttgccgatg	gcagccatct	cacagggtct	cttttcgggg	80580
aaggggcagga	attatggatt	aagtgcagta	gtaattgtaa	agcacttaal	acaaggaggg	80640
cgcataataa	gtacctcata	aataatgacg	gccattatca	tgactgaggt	gtatgcagct	80700
gtcggggatt	acgggcagctt	cagaattttct	ggtgggcagg	gctcaaaagg	agcaaatcac	80760
actggaagtc	gagggtgagg	actgcttctg	cacagactgc	ttagctggag	agaatgagga	80820
aggcttagag	gagatttaga	ggaacttaga	gtcctccgcc	tccaaactctg	tgggatctgc	80880
tcctgtgcc	gagacattca	ggggattttt	cgcactctcc	cctcccctac	gtccctcccg	80940
ccccatccaa	ctaaccacac	aacacataca	aaatagccccc	tgcgagggttc	tgccagctgg	81000
aagggaacag	gagaaaggcg	ctgcgcttct	ttgctgatgc	cctgtacttg	ggccctggtt	81060
agcccccagcc	acttgtccac	tcagcctgca	gagaaatccc	acgtagaccc	cgcccggttc	81120
cttggtctca	gcctaatctcc	ctttgtgtgg	ggtgggatgc	acgatccaa	gttttatttg	81180
ctacagacag	cggggtgtgg	tcggcccaag	acacagattg	gctcccaggg	gcctctcgga	81240
tcctgtgtgg	ggcgccgctc	agcctccgg	tgccaggcccg	gccgaggcca	ggagggaagcg	81300
gccagaccgc	gtccattcgg	cgccagctca	ctccggagct	ccggagccct	tgccagcgct	81360
gcttccgtcc	agtgccgctg	gacgcgctgt	ccttlaactgg	agaaaggcct	caacttgaaa	81420
tcagggtctc	atccctagtt	agcgtgtgac	cttgagcagt	tgactttatt	tttcagtgcc	81480
tagttttcca	gataccagga	ctgaactcca	ggactattac	tcactctggag	ggttttagcc	81540
agtaccclog	cataglaaat	ttccalgtca	gttttggtta	cctttcatgc	acttgcaaaa	81600
atgccatgct	ctgaaacgaa	ataggcacat	cttttttttt	ttttttttta	aggagctctc	81660
ctctgcacca	ggctggagtg	cagtgggcg	atcttggtct	actgcnaact	ccacctcccg	81720
tgttcagagat	tctcctgcct	cagcctccctg	attagctggg	actacaggca	tgccacgacg	81780
cccagttaat	ttttgttttt	ttagtagaga	cgggggtttcg	ccatcttggc	caggctggtc	81840

-continued

taactcctga	cctcaggtga	tctgactgcc	tcagcctctc	aaagtgttgg	gattcacaggc	81900
alaagccac	gcctctggcc	agaaatgaaa	taaglaaatc	tlttaaccctg	ctctaaccaat	81960
atagtgaana	gaccacatta	ttattagagc	aggtaaggg	atttgccctat	ttcgggttct	82020
agttatagtc	ttanaacttg	acattcttgt	agaangtaaa	aagttccctc	ttcaaggttc	82080
cccttcttgt	taagaataac	atcataagtg	ttagaagtaa	tagtttattt	taagagctaa	82140
ctttcttcaa	gcctccttgc	tttgctctaa	taactctttg	ttaagcccta	tcctatgtaa	82200
ctgttggaac	tgctacacag	caagttccag	ttccacagcct	atgccccttc	cttatcttga	82260
aatgtttatt	cttccctaaa	ccttcgggta	agcaacttcc	ctctcctctt	cgtctcttcc	82320
tgcaactacc	tatttagaaa	gttttaggct	attagcaaat	cggctatcag	tttaagagtg	82380
tgaggctccg	ctccagccaa	tgagatgaag	acatagcagt	gaggacgacc	caaatgcgtc	82440
agggataaat	atgttttgct	ttccttttgt	caggtgtgct	ctcgacatcg	ttccatctgc	82500
gattgagcac	ccctttctga	gaaagttaag	attgccttgc	tgagatctct	ttgtctccgt	82560
ctgacttttt	cttcgltgga	cagallatct	atttctaaca	attttgggtat	ttctaaccat	82620
ctgaacaaac	ttgggctagt	tgtctcttct	ggcctgttct	ccccatccgt	caatgataaa	82680
acttcatttg	tttaaaaccc	ccagcgaaac	tttattgagt	tactattacc	ttcctgcctt	82740
ccccaaaccc	aacccacagg	agcagttaca	acctaagccg	ctgagcgcac	tcgccgggtg	82800
ttaagaagca	ccaaagacag	ggaggcttga	ttgattttgc	tttgggagta	gagggtcaga	82860
agattccacg	gaaaalggca	tttgagcaag	gatgattcac	tgagactagc	ttttaaalac	82920
tgccgaggct	tttatgttgc	agtccttacc	aaagttagag	attcgacagg	actgcactcc	82980
gaataaagcc	cgtctccctt	tttcattctc	taatgatcca	gggagctgct	ggttccgcct	83040
gcggcagggt	gtgccttttc	ctaatacagg	ttctgcctcg	cctcgaaccc	gcaggccgtg	83100
gcgggttctc	ctgaggaaag	agggaactgg	gtgcagggtg	aaagtgtctg	tgccggccag	83160
cgctgtgag	caaaactcaa	acggaggagc	aggaggggtc	gagctggagc	gtggcagggt	83220
tgacccctgc	ttttagaagg	gcacaatttg	aagggtaccc	aggggcccga	agccggggag	83280
ctaaggcccg	ccccgttcca	gtgctgggga	gggtctcccg	cccaggggag	tagttttgca	83340
gagactgggt	ctgcagcgct	ccacccgggg	ccggcgacag	acgcccacaa	acagctgcag	83400
gaacgggtgc	tcgctccagg	cccccagggc	ccgggaaaga	ggcgccgggt	gcacgcgcgg	83460
gtcacgtggg	cgatgcgggc	gtgcgcccct	gcacccgcgg	gagggggagt	gggaaagggt	83520
gcggggccgg	cgcttgacct	cccgtaagc	ctagcgccgg	gaaggaccgg	aaactccggc	83580
ggcgcgcttg	ttgataatat	ggcggtctga	gctgcctggg	catcccagag	aggcgggtgg	83640
gcccactccc	ggaagaaggg	tcctltttcg	cgtlactgca	gcggccccc	tggaacccga	83700
agtcggggcc	ggttgctgaa	tgaggggagc	cgggcctccc	ccgcgccagt	ccccccgac	83760
ccctcgtccc	gaacccgggc	ccgcctatgt	cttcttccgg	cggaaaggta	gctgaggggg	83820
cgccggccgg	gagctcagcc	gggcccacgg	ggcgccgggt	ggcgagggtg	gacctgcagg	83880
gctttcccca	aggcgccagc	aaggccttca	gcgagcctcg	acctcggcgc	agattgcccc	83940
tgagtgccct	gctctgctcc	gggactcttc	tgggaggggg	aagggtggct	tcttgccgca	84000
ggtcagagga	gtattgtcgc	gctggttcag	aagcgattgc	taagcccat	agaagttcct	84060
gcctgttttg	ttaagaacag	ttcttaagggt	ggggttagtt	tttttgtgtt	tctttgagga	84120

-continued

cogtggatca	agatcaagga	aatctcttta	gaacottatt	atggaaagtct	gaagtttcca	84180
aatgltgagg	glttltalglc	taaaagcaac	acgtgaaaaa	altgtttlct	tcacccaglg	84240
ctgtcttcca	atttctctct	tggggggagg	ggtagtact	gctgttacta	aaataaaatt	84300
acttattgct	aaagtctccc	aacagggaaga	caactacttt	tgatgacttt	ggcaagtttg	84360
ctaactactg	gaaccctaac	ttacaaaaga	actacttaca	tttttgattt	ccagttgtat	84420
tacotgcccc	atgtttacgt	agaacacgct	taattttgat	tctgggtaac	gttgttgca	84480
ttcattaaaa	atacatatcc	gaagtggaga	agtatgggtc	tgtggacaga	agtgattttt	84540
cctgtcaatt	cctgttgctt	cagataaaat	gtaccagaca	gaggccgggc	gcggtggctc	84600
acgcctgtaa	tcccagcaact	tctggaggct	tggcgggtgg	atcacctgag	atcggggagt	84660
caagaccago	ctgaccaaca	tggagaaaac	cgtgtcttac	taaaaataca	aaattagcca	84720
gggtggtggc	gcactgcctg	aatgccagct	acttgggagg	ctgaagcagg	agaatcgctt	84780
gaacctggga	ggcggagggt	gcggtgagcc	gagatagcac	cattgcactc	cagcctgggc	84840
aaaaagagcg	aaactccglc	tcaaaaaaaa	agtaacagac	agaaatgggt	tttgtttlct	84900
ttttttgttt	tggagcggag	tttcgtctct	gttgcacagg	ctcgagtcca	atggcgcgat	84960
ctcagttctg	gctcaatgca	acctctgtct	cccagggtta	atcagattctc	ctgcctcaga	85020
ctcccaagta	gctgggatta	cccattgccc	accatgcccg	gctaattttt	gtattttttag	85080
tagaaacggg	gcttcaccat	gttaggctgg	tcttgaaccc	ctgacctcaa	gtggccctcc	85140
cacctcgccc	tcccaaaaglg	ccaggatlac	agggcatgagc	caccgcgggc	agccagaaaa	85200
gggttttgga	aaaagcacta	aacaaaatcg	aacttgggtt	catatgacag	ctctgctgct	85260
aactgttaaca	ggggcgagcc	agtaaaccta	ctttctctgtc	ttctgtcagc	tgagaattag	85320
atgattccca	aaggcccaat	gaactctgaa	tgactttaaa	tacttcttct	taagtgggta	85380
cacggttttg	gtaactgatg	ccaggtgatg	aatgcattgaa	agtgcctaat	gaatgaaacc	85440
ggtaaaaatag	taggaggaag	ctttatlggt	aaggcagggg	tatacctaata	agctctctaa	85500
tttattggta	ttgaagtgggt	taacttttgt	ttttttaaag	ggggaaaaca	ttctaagaat	85560
aatgaggcaa	actgcattat	gcacaagaga	ctgttgtctc	tattcaacaa	atacattttg	85620
agtgtccaga	gtctgcacgg	tgctgtgcta	ggccttcacg	attgagtagt	gaacacagga	85680
atgtccctgc	accatggag	cttattgtct	actggggtag	acagataata	aataagcaaa	85740
caaatcttct	ctcttctccc	tttcgtctca	tgtaaagtgtg	tgtgtatagg	tgtatactta	85800
caagttgagt	aaagtgttat	gaaagattaa	gaggagaaat	gcatttttgt	tagatgttag	85860
aggactcagc	aggtgacctt	gaaacttaga	gctgaaggat	cagtaggagg	taactagaga	85920
ggccagggaa	tgcgatgttc	aaaggccagg	aggcaagaaa	gagcatgggtg	cccttcaaga	85980
gaggaaaaga	ggctactgtg	actggagcat	agatgtaggc	aagtgttggg	tgattgagag	86040
ctctacgggc	catggttagg	ttttattcct	aatgcacaga	tgcacaaacat	ggtggttcct	86100
atclgaalc	ccaglatlll	aggaggccga	ggcaggaaata	tagcltgaac	ccaggagtlc	86160
aagaccagcc	tgagcaacat	gagacctgta	caaaacattt	aaaaaattgc	tgggtatgat	86220
ggtgcacacc	tgttggtccca	gctactcagg	aggctgaggc	agaaggatca	cttgagccta	86280
ggagggtgag	gctacaatga	gccatatttg	agtcactaca	ctccagcctg	gatgacaaag	86340
tgagaccatg	tgtcaaacda	aatacagaaa	gaatattaat	ttaaaaattt	gaaagaggag	86400

-continued

tgatctgaa	ttatatotta	aaaagatcat	tctagggcat	ggtggctcat	gcctgtaac	86460
aagggtcttg	ggaggctgag	acaggaggat	caccigaggc	cagtlcgaga	lcaacctgta	86520
cagcatagag	agatccatc	tctacaaaaa	gaaaaaataa	atagctgggt	gttgtaggtt	86580
attcaggagg	ctgaagcaga	aagatcaatt	gagccacgga	gtttgagggt	gcagtaagct	86640
algalccac	cactgcaaca	cagtgagatc	ttgtctcaaa	aaaaaaaaaa	aatcattcta	86700
ggtgcttttt	ggaggctgga	tgtggttaaga	gtagaagctg	gagatggtcc	tgtagggat	86760
togatccaga	ctttaaatcc	catcaatgca	ttgagtcocga	aatttaccatc	actaogttgg	86820
atccttgccc	ctgaatccag	actggtatat	ccaaactttag	gttcagtttg	tatctctacc	86880
tgaccaatat	agagggtgac	agtcttttgg	cttccctagg	ccacattgga	agaagaattg	86940
tottgagcca	cacatagagt	acactaacgc	taacaatagc	agatgagcta	aaaaaaaaac	87000
gcacaaactta	taattgtttta	agaaagtta	cgaatttggt	ttgggcacat	tcagagccat	87060
cctgggcgcg	gggattggaca	agcttaatcc	agtatatacc	ttcaacttac	aatatctaaa	87120
attttatgcc	agatttagtc	attttaaacc	tgctaatcag	ttttctcaca	gaagtagtat	87180
tttggtcttt	ttctctttct	tttttttgag	atggagtttc	gctcttatcg	ttcaagctgg	87240
agtgacgtgg	cgggtcttgg	ctcaactgca	cctccagctc	ctgggttcaa	gtgattctcc	87300
tgccctagcc	tcgcaagtag	ctggaattac	aggcatgcgc	caccatgacc	agctaatttt	87360
tggagacagg	gtttcaccat	gttggtcagg	ctggttttgt	actcctgacc	tcagggtgac	87420
tgcttgctcc	ggctccocaa	aggctgggat	tacaggcatg	agccaccgct	ccgggctgca	87480
tttttggatt	tttagttgct	cagcccaaaa	ctttagtaca	tctttgaacc	tctctcttcc	87540
tctactctca	tatctgctcc	atcagcaaat	ctgttaggtc	tactctcacac	atatcgaaat	87600
cctaccacgt	ctcaccatct	gtgacaatta	acacccctgg	ctaggcagtc	atctctgtta	87660
agattgagtg	gttaaggatg	tccctcaagg	agatgacatt	caaatcttag	cttaaatgtc	87720
aaggaggagc	tggtttttata	aagattgagg	aggcagcatt	attttgccat	aggcttccat	87780
ttggtttcca	ttccattctt	gatacttatg	gtatataatto	aaacaaaatg	cacagaaaca	87840
gacccaggta	tattgggaat	ttcggatata	gagttccctag	ttgggaanaag	atagactgat	87900
ctgtaaatga	tgtctgttat	ccctaatctg	gcacaaaata	atttctgccc	tctctctaca	87960
tatctcagat	caacagactt	ttctctgtta	gggcacaaac	ataaatattt	taggctttcc	88020
agaccatatg	gtttctgtca	cactctcctt	tatccttgaa	gccatagaca	atatgttaac	88080
aaatgggcat	ggctgtgcta	cgataaaact	ttacttacaa	aaactggtag	tgggccagtt	88140
taggcattgc	cagcaacttg	ggaggctaa	gcagatggat	cacttggggg	caggagtgtt	88200
agaccagcct	ggccaacatg	gtgaaaccc	gtctctacta	aaaatacaaa	aaatagctgg	88260
gcattggtggt	gggtgtctct	aattccagct	actctggagg	ctaagcacaca	agaatcactt	88320
gaacccaggga	ggcagaggtt	gcagtgagct	gagatagccc	cactgcaactc	cagccagggtt	88380
gacggagctc	taaaagcaaaa	caaaacaaaa	ggtagtgggt	tglatittgg	ccatgggctg	88440
tagttttcca	atccctgatg	cagaaacaaa	ttccaggtaa	ataagagcct	ggaatgttaa	88500
aaaaacaaaa	cttggaagtca	tgtagaagaa	caggtagggg	gaacantcct	gattctcagg	88560
taggaaggga	tattgtctaa	aataagacac	aggaataat	aatccatggt	gtgtaaattt	88620
gactacgtta	aaacttaaaa	ctttcgccaa	gcgcggtggc	tcaagcctgt	aataccagta	88680

-continued

ctttggggagg	cagaggttgag	cagatcacca	ggtcaggaga	ttgagaccat	cctggctaac	88740
acggtgaaac	ccggtctcla	ctaaaaatac	aaaacattag	ccgggctggtg	tggcgggcgc	88800
ctgtagctcc	agctacttgg	gaggctgagg	caggagaaatg	gootgaaccc	gggaggcgaa	88860
gotttgagtg	agctgagatc	gcgccaactg	actccagcct	gggcgacaga	gtgagattcc	88920
gtctcaaaaa	aacaaaacaa	aacaaagcaa	aaaacotaaa	actttcatac	aataaagtat	88980
acctaagata	cttctagaag	agaagattta	catccaggac	gtgtatggaa	tttctgcaag	89040
taataagtaa	aagacaaggg	acatgaagag	gcagtccaca	aaagagggaag	ccaaaatgac	89100
caataaacat	gaaggatgt	ttaacctcaa	aggaaacaag	gaatgaatt	aaaaacatca	89160
aatgcacatt	caaaactagt	aagtggcga	aattaaaaat	accaaggatg	agaatatgaa	89220
goatggctat	atgagtgcat	ggaatggtac	agtcacttct	attaaaaatg	cacataattt	89280
gttttttatt	tatttttttg	agacagctcta	tgtcgcccag	gctagaatgc	agtggtcatga	89340
tctcgggtca	ccacaatctc	tgcctcctgg	gttcaagcaa	tctcctctgac	tcagcctcct	89400
gagtagctgg	gattacaggc	acatgccaca	acgcocgggt	aagttttgta	tttttagtag	89460
agacagggtt	ttgcctatgt	ggccaggctg	gtctcgaaact	cctgacctca	ggtgagctgc	89520
ttcccaaatg	gctgggatta	gaggcgtgag	ccaatgctcc	tggctgaaaa	aaatgcacat	89580
aatgtgttac	ctagcaattc	catgtctaga	ggcttatcct	agagaaattc	ttgcttatat	89640
gcataggaag	acgtgtacta	gaatgttcac	tagttgaatg	tttaagtga	aattaggaaa	89700
taaaagtaaat	gttcattaac	aggaaaatga	gtaaaaggtat	atttataaaa	caattaagta	89760
gtataaatga	ataaaataga	gctgcgtgaa	tgaactagaa	ctgggtcaat	agtcattgtca	89820
gattattgaa	tgnatacagg	tcagatatgt	atagagtgtc	atttgtgtaa	ttaatttttt	89880
tttttttttt	gagatggagt	ctcactctgt	tgcccaggct	ggagtgcagt	ggcgtgatct	89940
cagctcactg	caacctccac	ctcctgggtt	aaagtgtatc	tctgtcctca	gcctcccgag	90000
tagttgggat	tacaggcatg	caccacacatg	ccagctcat	tttctatttt	ttagtggcca	90060
cagggtttca	ccatgtttgc	caggctgggt	ttgaactcct	gacctcaagt	gttccaccca	90120
acttggcctc	ccaaagtgtc	aggattcacg	gcgtgagcca	cgtgtctcag	ccatttgcgt	90180
gattttttaa	gatgtgcaga	ataatgccat	taaaaaaaat	acacatacat	gtatatatat	90240
acacgttttg	ctgggtgtgg	tggctcacac	ctgtaattcc	agcactttgg	gaggctgagg	90300
caggaggatc	acttgagccc	aggtgtacaa	gactagcctg	ggcgagatag	caagacccca	90360
tctcaacaac	agaaaggata	attaggtatg	gtggcatgag	aggatcactt	gagcccagga	90420
gttcgagtgt	tatcaggcca	ctgcactcta	gootggacaa	caaaagcaaga	cgtgtctcca	90480
aaaaataaaa	aataaaaagt	atttgtatgt	ggctcatagtc	aaaaaacgta	catggaagga	90540
aaatgtcctt	atttatcttat	ttattttttt	ttttttaaga	cagagctctg	ctctgtcacc	90600
caggctgggg	tacagtgggtg	ttaotctcagc	tcaacgcacat	ctcggcctcc	cgggttcacg	90660
cgattctctc	gctcagcct	tctaagtagc	tgggaactaca	ggtaccgcgc	accacacccct	90720
gctaattctt	gtgtttttcag	tagagacagg	gtttaccat	gttggcaagg	ctggtctcga	90780
actcctgacc	ttaagtgcgc	caccgccttt	ggcctcccaa	agtcctggga	ttaacaggtgt	90840
gagccactgc	gcttgccag	gaatatctcta	atttagtaag	tatttatatc	tgggaagga	90900
agggtcaggt	ggtgatccat	aggaaactcta	aagtctatgt	ataatactta	gggggacaga	90960

-continued

<hr/>	
aggaataaaa gcaaaatgct gatatttgat tgttgagttg tgatatgtt agaagtataa	91020
calaggagat cagattgala gtaggagaat gtllttaggt ggtaaaagtg gaacoglggt	91080
ggtttgtttt ggcagtagaa tcagttgggtc atagtttgta tgtggaaggt aataaacaga	91140
ccatgttaag gatgaattcc ggaatttttg tctgagtagt ggggtggtga cagtgtcatt	91200
calgagggaa gatgaagaat gaggtaggaa cagggttggg agaagatgac atgttccctt	91260
ttagacaagt ggaattatgg aagatggcag gtaggtgggt agctatatga atttgagata	91320
aaagatttag gatggagata taaatttagg agtaacagcg tatctatggt attgtaagcc	91380
ttaagaatgg gtaggatcag ccaggaaata cagatgtata tgcagaagag agggagtcaag	91440
gaagccaaga caagttaatg ttaaaagtga gtgatgtagt ccatgggcag atgctgctga	91500
gagggtgca aacaccagtg accctaacac attttttaaat gtctcttcc tgacagcagt	91560
gatcagtagc tgcaacgac ttattttatt ttttcatggt agtctccaca cacttgaatg	91620
tagacttttt gaaggcaaaa tcaattgctt tcttgagctg ggagcatgtc tggccacata	91680
caagcactca acagttgaig tattgaactc atccagatac tctgagggog agttatttcc	91740
tgtacttagc ctttcacctt tcaatgttta agagcaaaaa tcaagagatg ggcacgtttt	91800
ggcatttttt attttggtaa ccttttactg gtaagatttt ttaattgttg aaaaaaaaa	91860
caagaaaaga ggggttaaaaa tagtcttatg tcatgacctg tgatagaatt cacacttggc	91920
ttaagctgct gggcaccttc ctatcttgga tgtcatatta gcttatctac agcagaattt	91980
ttactgtttt algtagtaag gaagcaatta talgaltatt ttacagacaa attattcttl	92040
atcttttatt tttttagaag gagtctctct ttgtctccca ggctggagta cagtgtogcg	92100
atctcggtcc actgcacact ccgcctcctg ggtccaaaga attctctgac tcaagcctcc	92160
aagttagctg gcttacaggt gtccgcacac acaccagct cattgttttg tatttttagt	92220
agagatgggg tttcaccatg ttggccaggc tggctcttag ctactgacct caggtgatcc	92280
acccgccttg gcatcccaaa gtgctggaat tcaaggcctg agccacgctg cctggccnag	92340
acaaattatt atactctgag tgttagaggo ttaggatggt ttcaactgat gctatgggag	92400
gaetaagtaa taagatatga tacaacaaca aagacctttt ttcaactatg tcttagtagc	92460
tagtactatg gatgacaact ggtaataata ttggttagca ttgtccata atttactgtg	92520
ctagttactc ttccaagccc cttacaggta tatatttttt ttcaatcaata atcctctaa	92580
gtagttttta ttattgacct aatttttata atcaagaaaa ttaagaccca gagaagttag	92640
taacttgtcc aagatcacat ggcctataag tggtagagcc agaatttgac ccagatggt	92700
gtgactacat tgtctctcca taagcagggt caactctttt gactggatgc tgttccaa	92760
tcacttccct agagaagcct ttgtgcacaa ctacccctct gtgcctcctc ccaaggctgt	92820
ccattgttct agaaccttga atactcatct tagaataaag ctggctctaat ttttacagt	92880
ttatagaatg gatctctgac tgcaaaagtt ggtcataatt atctttttat gttctagtga	92940
aaggcaaaaga caaagagaag acccagatg tgaagtcacat laaaggtaag ttctgccctt	93000
ggcagtcac tgcatataaa agtgatgtgc tttgcatttg tgagttcttt aatcctgtta	93060
tactctctct ttttggcata atcattttctg ccttatttta taattactta tgattttgat	93120
ttatttccct ctttaacctg tataatgctt taacatctag catataataa gtaggctttt	93180
tttttttttt ttttttggga gacggagtct tgctctgtta cccaggctgg agtgacgtgg	93240

-continued

cgcgactcttg	gtcactgcga	agctctgtct	cccggttca	caccattctc	ctgcctcagc	93300
clcccccagca	ctggggacta	caggltgcacg	gcgcacgcgc	tggctaattt	tttgtatttt	93360
ttagtagaga	cagagtttca	ccatgttagc	cagtatggtc	tcgactctct	gaacctgtga	93420
tcgcgcgcgc	tcggcctccc	aaagtgtgg	gattacaaagc	gtgagccacc	gcacccggcc	93480
gtaagtaggc	tttttttacc	ttaattttat	ttttttgaga	tggagtcttg	ctcttatccc	93540
caggctggag	tgcaagtggg	ccatctcggc	tcactgcagc	atccacctcc	cggttccaag	93600
cgattatctc	gcctcagcct	cccgagtagc	tgggattaga	ggtggccggc	acccatgccc	93660
gctaattttt	gtatttttag	tagagacagg	gtttcaccgt	gttggccagg	ccagctctca	93720
actcctgacc	tcaagtgate	cactcgcctt	ggcctcccaa	agtcctggga	ttacaggcgt	93780
gagccaccat	gcctggccat	aagtaggctt	ttactgagcc	ttgtgtgtat	tggctatcct	93840
agtgattaca	gtgaaccagt	gcccttctta	ttaatcacac	atttaattgt	tcocataaag	93900
tgattagtto	actttattta	tttagtaaga	caaaaaatga	agaatactct	taactgagca	93960
gtctgttaac	tgtaggaaag	cactgcacct	tataaggctt	agttttctgt	catttatcca	94020
gaagtatggt	tgattacagt	ttttactttt	ttatttgaat	gaacaaacct	aatttaaaat	94080
atattttgtt	tttttttgt	tgggatcgat	acattgtcct	tgtttataga	ttagagcatg	94140
ctttttaaag	atgctgtatt	actcactgat	tttatttgtc	cagtgtacag	agattggaag	94200
gggaaaaatta	taattggaaat	tgtttccata	gtcattacat	attaatttca	tcaattttat	94260
tcataaaaat	ctgtagattg	ctacttattt	agatttttcc	ttcaaatggt	tttatgttgt	94320
attgcttgca	ctgagtatct	attctatatg	ctcaatttgc	tggagaagaa	gactaattat	94380
aaccttagca	agttgtaaaa	ttagggaaaa	aagtaaggta	ccttacagcc	tagtttactt	94440
attttctatg	taaaagccagt	tagattccac	attagttcaa	actgccttct	ttgagcaaaa	94500
cttgattggc	agtgataaaag	gcttaaaagc	cttctcaagc	agagacctgt	aaagactaga	94560
tctgactgta	tlagaaggaa	ggaactlaga	tgtttcaggc	agtgagaaca	ccagttcttc	94620
actctaaaact	ttggccactaa	cagtatgacc	ttgggaagtt	gtaacctttc	tcagattctt	94680
catttgttga	atggggggat	tggcctagct	aattttctaa	tctctacttg	gctnaaaact	94740
ctgtgtctta	tactctgatt	atgaagtcac	taactgttgc	ttaacattca	ctgaacttct	94800
cttaggataa	tacagaagca	gtacaagaaa	cagccctcca	agatgtttgc	agtcgtgtta	94860
gaagagcaaa	cttatacaca	gaacagttagc	aaatagacca	aaataataat	agctgccatt	94920
tatagaacac	ttcttctggt	ctgggcatta	gacaaaaact	gactataacg	gtgaacaaaa	94980
aagacttagg	tcctgccttc	attgaactta	cagattagta	ggggagagga	acattaatca	95040
agtaattcca	cagatggctt	agcctagatt	ggtagttagt	gaaglaaaga	gatgtgaacg	95100
gacttgaaaa	aaaattcggg	ggcaaaatgg	atagaagttt	attattgatt	aaatatgagg	95160
tgtgagagag	aggggatattt	aagattgata	cctaccttct	ggcttgccca	acagaaccca	95220
aacaggaaat	tatatgttca	gttttgttat	gttgggtggg	aggtgctttt	gagtcattca	95280
tttatatatg	ttatatatgt	tattttatat	gcatagtaat	tttaaggctc	gagtttttaa	95340
caaaaggtta	gagngtgatt	tttttagagtc	tagcaaacct	aagttgaatt	cctgcctggt	95400
gaataggctg	tttactagct	cattaaccta	gggcaagta	ttcaacttgt	tttcattttt	95460
gtcttcatct	ctaaaatgag	gaaaatatgg	tcttacaaga	ttgtcctgag	agatagatga	95520

-continued

aataatatcc	aaaaaaaaa	aaggtacata	gagaactcg	tatagtgcct	ggtatatagt	95580
aggctctcca	ttggtagcta	tattatctta	gttttaacat	agccttcagt	ttgttgaaat	95640
agtcanaactg	agtgaagcac	tgcaaggaaat	tcaagaggaaat	ttgagatcaa	caaatgattt	95700
ctgaagttaa	gggaagactt	catggcaatg	acacttacct	tgtataaaag	ttgaagaata	95760
agaaagattt	gaatgagaga	ttctttctct	ttctccctacc	agcccagctt	cttatittgag	95820
gatatatttg	gcaaaagggc	cttcagacaa	gtagaggag	atttttacag	aaagattgag	95880
atgaaggtat	agaaggtctgt	aaagaccaga	aaagagaatt	gagacagagg	aagcaggag	95940
ccactgtagg	ttttttgaca	agatattgat	gctgtaagta	tggtgtttat	gaagggttag	96000
tctggaaagag	atttgacgga	tggagacccc	ggaagttttt	ttgtttataat	acagaaagac	96060
ttgcactgag	ggtgaggtgt	taaaaaataa	caggtaagta	aatgtttaaa	catcttgaag	96120
gaaagatcaa	caaatcttgg	caagtaacaa	gataacagtg	aaaaagaatg	ggaccaagat	96180
tttgagtttt	ggagacttgg	ggtattgaac	gacaggggaa	ttgagaggag	aatcagatga	96240
tgatgtttta	agtgatatt	tagacagatt	gtgttgaga	tggtaaagtc	aatgtgggtg	96300
ggaatgtcta	gtagcgagta	atcagtgata	caagaccaaa	gcccagggtca	aagacaagtc	96360
acagatacag	atcagggtct	ttctatctgc	tccaaagagg	tgtacctag	gagctgttgc	96420
aaacagtcca	tgtggagggt	gtgagtaaga	tgtttccctt	gaatttgcca	gaattacttt	96480
tttgttgttg	tttgtgtttt	ttctgagaca	gattctctgt	ctgttgccca	ggctggaggg	96540
cagtggtcag	atcgcgcagc	tcactgcaac	ctctgcctct	cgggttcag	tgaattctcc	96600
gootcagoot	cccaagtagc	tgggattaca	ggcttggtgc	accaagccca	gctaatttct	96660
tttgtatttt	tagtagagat	gggtttctac	catgttggtc	agactgggtc	cgaactcctg	96720
gootcgtgat	ctgcctgcct	cagcctccaa	aagtctctggg	attacaggcg	tgaaccactg	96780
caccgcgtcc	cttgttaagt	ttatttttgt	gggaagcaaa	ggaggtttca	gcttttaaaa	96840
agtttgaaaa	ttattgtctt	ggtataaatt	aaagatttga	gagtaaatat	gctttctagc	96900
agaaagaata	aaagaagaac	agatagcctc	aagaagggga	gccaagaag	caggctatat	96960
ctgacacact	gggtgttgat	aaatgggtat	taaaagaatg	agagcaatga	gcagatagaa	97020
gagggaattta	ggagagataa	atcccatgga	gcccagaana	gatagaatla	caggaaaggag	97080
tggtaaaaat	aagttaactag	ttctaagaga	gatgttaaga	gggaccgggg	aaagccttgt	97140
acaaatgagt	tagtagcatt	ttacattata	tacattctaat	taagaaacaa	tgcagagatc	97200
tcaccattcc	tatagactct	tacttgtact	tgtctgaaca	cgaanaactgg	cttttgttta	97260
taataaagct	aaaaattatt	ttgtccaat	ttctcatgaa	aataaaaaata	aaccttcttt	97320
taacattgaa	aaaatagttt	gaagacagtc	actcttcatt	ttgiaattcc	cacaactatt	97380
attgaatgac	tgaattatct	tttattctga	agccaaaggg	gtgatactga	tatttcttca	97440
gaactactaa	aatatatttt	atgaattttt	agtygtcttt	atcttttttt	gttttttttt	97500
ttgagatgga	gtttactccc	cgttgctcag	gctggagggg	agtggtgcaa	tctcagctca	97560
ctgcaacctt	cgcctcccag	attcaagcaa	ttctactgcc	tgggtctccc	aaagtagctg	97620
gattacaggg	acctgcccc	acacacagct	aattttttgt	atttttagta	gagaaagggt	97680
ttcaccatgt	tggtcaggct	ggtcttgaa	tcctgacctc	aggtagatca	ccacacttgg	97740
ctccccaag	tactgcgatt	gcaggcatga	gccacacatg	ctggcctgag	gaatattttt	97800

-continued

ctagggttcc	cccccccaa	gcattttatto	tgcaatttta	gttttgttcc	taagcaagc	97860
aagggtlaag	gattlaaaaa	laalcoglat	tlilagaalgc	tlilcggctt	tgltactlil	97920
tatccacagt	agaagtcttc	agagaatgat	ctccctcttt	taatttaact	ttttggcaca	97980
gtattttgag	aattataaat	aattattagna	tgttttctgg	ctgggtgtgg	tggtcctatgc	98040
ctglaactct	ggctactlgg	gaggctgagg	caggagaatc	acttgaacat	gggaggcaga	98100
gggtgcagtg	agccgaggtc	atgccactgc	actccagcct	gggtgcacaga	gcaagactct	98160
gtctgggaaa	aaaaaaaaa	aaaaaaaaag	tgttttcttt	cttattttcc	accaacttgat	98220
taagttactt	ttcctcttaa	gtattttttg	ctgagtatgc	tgaacttaaga	gtaatgttac	98280
aaaatttaatt	ttttaaaagt	ctctgaaagc	cccttttatga	gagtttttagg	ctatcaaat	98340
gtgttaatt	cttaacaatt	ttttgaaaaa	ttatagcttc	aatatccgta	cattcccaac	98400
aaaaaagcac	taaaaaatcat	gccttgctgg	aggctgcagg	accaagtcac	gttgcaatca	98460
atgccatttc	tgccaacatg	gaactccttt	caagtagcag	gacagccaca	cttaagaaggc	98520
agccaagcca	calggaggcc	gctcattlgt	glgaactlggg	taaglaacta	tcattttlta	98580
ttactttgta	ttagaaggat	ttgagtacaa	tatgtgaaac	ttctgtcata	ggatacagaa	98640
ctatataaatt	ggnaagtgct	ttggaaaaaa	tgtattttaaa	ataacagcta	caagtataant	98700
gggtagctgt	gttggtttcc	tgtaaatata	gaatataaag	catgccagct	agaaaaacaa	98760
gcatttccag	aagaaatata	tctgatcaact	aaatataaat	atatgaaaaa	gatgtctcac	98820
ttlallactg	aggggaaglgc	aaallaaaa	aalcagllaa	tgllctccta	acacallagc	98880
atatttttta	aagtttgaca	atttgaaagt	cagtgaagat	gcagggaat	acccctccta	98940
tttagtgata	atataactctg	gtgaagactc	tttggaaagc	aatttggaaa	tcagtataaa	99000
atatgcatgt	catttaggcc	actcttctta	agacctagcc	ctcagatatg	ctcattcata	99060
tgtgcaggtg	tgtatgtgtg	tgtgtgtgtg	tgtgtgtgtg	tgtatgtgta	tgtatgtatg	99120
tatgtatgta	tgtatgttga	aggctattca	ttatagtatt	gtttgtgata	gcaaaaaatt	99180
atggacaaca	tataaatatc	tgttataggg	aaataaccaa	attgtgggat	acgcattgctc	99240
tggagtataa	tatagccatt	tgtttctatt	tattttattt	cttgagacag	ggttttactc	99300
tgttgccag	gctggagtgc	agtggatatga	tcattggttca	ctgcagcctt	caactcctgg	99360
gcacaagcca	ttctctcgc	tcagcctcca	gagttactag	gaactgcaggc	atgtgtcacc	99420
accccagat	aattttttta	ttttttgtag	agacagggctc	tcactatggt	gcctaagctg	99480
gtctcaaat	cctggcctca	agcaattctc	ccacacaggc	ctcccaaggt	gtggggatta	99540
ccaactgtga	ccaccacacc	tggttcagtg	tagccattta	gaatctctaa	aaagacgtgg	99600
gaaaatgtct	aaggcatglt	taaatglgag	aaaagcaagt	cacaglatgc	atgglaaaa	99660
cogttatatt	aaataaagtt	cttccaaaac	aaaaacatat	gcaggagacc	tttattttgt	99720
cagtattctct	taccocaaatt	tctgcaactta	gaaaatttga	tgtcatgttg	tcataagttg	99780
aaaaaaagat	ccatgaacca	atggacllct	aalaaaalca	glcctgcctt	tgacatctct	99840
ctctactttt	gtgtatatct	aaaccagagt	gtcaatgtgt	ttgtggggca	caacttagcaa	99900
taatacatag	cagacaaaaat	gcataatagct	cagagagtga	aattgtaagt	tttgtatagt	99960
caactataaa	ttgctgatga	gaatttaaaa	tggtgcagat	gctctggaaa	acaggcagtt	100020
tctttctctc	tttttttttt	tctttttgag	acagggtctc	actctgttgc	gcaggctgga	100080

-continued

gtacagtggc	gtgattacaa	ctcactgcag	cctcacctcc	ctcaggttca	ggtgatctcc	100140
cctcagtcct	cigagtagct	gggacatag	gcatgaccca	ccaagccctg	ctaatttllg	100200
tatttttttt	tttttttttt	gtagagacgg	ggtttcgcca	tgtttccag	gttggtctca	100260
aantctcgga	atcaagcgat	ccaattgcgt	aggcctccca	aagtgcctgg	attacggggc	100320
tgagctactg	tgcttcggct	aggoagtttg	tttgtttgtt	tgtttgttgg	tttattttat	100380
gttagacgga	gtctcacagg	ctggagtgca	gtggcccaat	ttttggctca	ctgcaacctc	100440
cgccctccag	gttcaagcta	ttctcctgct	tcagcctcct	gagtgcctgg	gatgacaggt	100500
gcctgccata	atgcctggct	gattttttgt	tatttagtag	atatgggggt	tcaccatggt	100560
ggtcagggct	gttttgaact	cctgacctca	ggtgatcagc	cgcctcggc	ctcccaaaat	100620
gctggggatta	caggcatgag	cgttcattcc	tggtcgtgtg	tttcttatga	cgtgaaaact	100680
gcaattacca	tatgacctag	cagttgcact	ctgtatttat	ccaagataaa	tgaanaacta	100740
ccttcacaata	aaaaacctgt	cacaaatggt	catagcagct	taataattgaa	aaactggagt	100800
lctctacgca	ggtgaatgaa	ctggllcatt	cataccatgg	aataccallo	agcaataaaa	100860
aggaaacaa	tggtgataca	tttaaccacc	tggtgaaata	tcaagggaat	tatgctgtca	100920
gacaaaaaac	agtcctcaaa	gaactacat	agtatgattc	cgtttgata	atattcttga	100980
aatagagaaa	ttaagagaaa	tgaanaagatt	agtggttgcc	agatgttaga	gacaggggag	101040
tgagaggggt	aagtggtgtg	agttataaaa	gtgcaacatg	agggatcttt	gttatgttga	101100
agttglatct	tgggcagtga	tgacagaaat	tcaatgtgal	aaaattacaa	agaacaaaa	101160
acaagaatga	gtatagataa	aaactgggaa	atctgaacaa	gttagagtgt	tgtatcactg	101220
tcagtatctt	agagtgatat	tgtactatag	ctttgcacga	tgttaccatg	ggagaaacta	101280
aagtgtacaa	gggatctcta	ggtatlatta	ttttttttag	gatgggggtl	cactatgttc	101340
cccaggcccg	tcttgaaact	ctgggctcta	gtgatccgcc	tgcccagacc	tcctaaagta	101400
ctggaattac	aggcgtgagc	gaccatgcct	ggcccttcca	gtattgtata	ttgaagcttc	101460
atgtgaattc	agcattatct	catagaattt	aattaaaaga	aattgtaaa	ctcacagag	101520
atcagaattt	cctcagattt	gtgatgttga	caaagatgaa	ctagttagaa	ctgacagtaa	101580
gaactgaggt	gagagcaaga	cgtgcttcca	aaacatgatt	tgaattacca	tggtattaga	101640
agaaactctt	tgacaaattg	atgaaccctc	cagtcagttt	tataagaatg	ccactcttta	101700
tgatcatgct	atgaagacca	attttttaaa	aaattttttg	tctttcctaa	caattagctt	101760
gtggttataa	tttaaattta	gttaaatata	agataaatga	ttttttatta	agtttagttt	101820
catttttcaa	ggtagcatct	caaagctact	ctttaacctc	ctatgaatga	ataatgctga	101880
gttcaataca	totttltaga	tatalccaca	attttccctc	aggataagtg	cctacaagtg	101940
gaattactgg	actgaaaata	atgcagtttg	ctaagacttt	gctatctgtt	cctgaatgct	102000
cctccaaaaa	ggttttgcga	gtttacatcc	tcatgaccag	cgaatgagag	tgttgcctat	102060
lctcctgtgc	ccttlttacl	gctlaataal	ttttgaaaaa	aalctaatll	gacagacaaa	102120
aatgcatttt	atgttaattt	gctttctctg	gattttttaa	gaggttgagt	atagttttta	102180
atatttttat	tgggcccttt	ggaaactagta	tcataagttt	tttttcttaa	gaatttatgt	102240
agctcgggct	gggcgcagtg	gctcacgcct	gcaatccccc	cactttggga	ggccgaggtg	102300
ggtggatttc	cgaaggtcac	gagtttgaga	ccatcctgac	caacatggtg	aaaccgaatc	102360

-continued

tctactaaaa	gtacaaaaac	tagctcagcg	tggtggcggg	tgccgtgaat	ccagctact	102420
taggaggtcg	agtaacagaga	atcgcttgaa	cccgggaggt	ggaggttgg	tgcatgtagc	102480
cgagatcgcg	ccatttctct	ccagcctagg	caacaagagt	gaaaagtcct	aaaaaaaaa	102540
aaaaaaaaa	aaaaaagaat	ttacatgggtc	tgaattgcc	ttaaaagaga	tatgagaatt	102600
attgagtaac	aaataacttt	ttataaattt	aggcaagttt	tggacgattg	tactttgttt	102660
agaaacccaa	agcatagtat	ttgtagtttt	tttattttact	ttagttgcta	ggaagttaac	102720
tttatttaag	gtctctggta	ccagttgttg	ctaaaagtga	ttgactaato	tgtaaatctg	102780
aaattattttg	ttgtctgaact	gctaattctt	ttgtctctat	cttttaggca	gatcttgtct	102840
ggactaccag	actcaagaga	ccaaatcaag	cctttctaa	acccttgaa	aagttctgca	102900
cgacactatt	gtctctccct	acttcaattc	attcatggaa	cttcggcgaa	tggagcattt	102960
ggtgaaattt	tggttagagg	ctgaaagttt	tcattcaaca	acttggtcgc	gaataagagc	103020
acacagttta	aacacagtga	agcagagctc	actggtctgag	cctgtctctc	catctaaaaa	103080
gcataaaact	acagcttctt	ttttaactga	ttctcttgat	aagagattgg	aggattcttg	103140
ctcagcacag	ttgtttatga	ctcattcaag	aggaattgac	ctgaataata	gaactaacag	103200
cactcagaat	caattgtctc	tttccnagga	atgtgacagt	gcccattctc	tcagtcttga	103260
aatggccaga	gcagggaactc	accaagtttc	catggaaaac	caagaatctt	cctctacact	103320
tacagtagcc	agtagaata	gtcccgcctc	tcactaaaa	gaattgtcag	gaaaactaat	103380
gaaaagttag	tatgtgattt	tcttgtgtgt	acatatgtgt	ctcactttct	ttttttaatt	103440
tactaagcag	aacttcagat	gaggaataaa	atgattggaa	tatttttttt	ctcctctaac	103500
tacttgtaa	tttgaggaa	tttgagaggt	gtagttaggt	cagatcagtg	tatggaaag	103560
gagcaggagt	gactggacct	tctaagaagt	gtgttatcag	aattagtaaa	tgaagggtca	103620
aatgtcctac	ttttcccttc	cactgatttt	gacatcaaac	cattatccac	atagccttat	103680
ttcctccctc	ggtcttaatt	ttattaatat	tttactgcac	tttgacagata	aaatttttaa	103740
aaaattttta	aaaattggca	ataagtgaca	tttattaagt	tcagtgccta	gtgtatatatt	103800
ggettttatt	tattagtcca	aagacctttg	tgccggtagt	aggcatgatt	atcttttttt	103860
ttttgagatg	gagtctttgt	ctgtgcacca	ggctggagtg	caatggcgcg	gtctcggtct	103920
actgcacact	ccgggtttcat	gccattctcc	tgccctcagc	tcaccaaatag	ctgggacac	103980
aggcgctctc	caccacaccc	ggctaatttt	tttgtatttt	tagtagagac	ggggtttcac	104040
catgttcgcc	aggatggctc	cgatctcctg	actttgtgat	cgcctgcct	cggcctccca	104100
aagtgtctgg	attacaggca	tgagccacgc	cgcccggaact	gattatctta	tttacacatg	104160
agaaaaccag	ggcttagaaa	ggttaggttaa	cttcctctag	gttgtacagt	aaatgtggaa	104220
ctagaagcat	tttgacaaga	gcacctgttt	ttttttcttc	ctatttagtt	tagaatttat	104280
atactcttaa	ttatcaactg	ggattttgat	tagaacgctc	tcagtgtctt	tttcaatcta	104340
aatgttcltt	gtgtctlaaa	gggctaagtg	atttcttcag	atcttttagt	tcactcattc	104400
tcagtgaact	aaaatgaggt	ctaactctgt	actgaatcaa	gttttcagca	tgttatttcc	104460
ttcctccctc	cctccctcct	tccttcctc	aacccagctc	cagaggagct	gggattaacg	104520
gcgcgcgcga	ccactcctgg	ctaattttta	tatttttagta	gagacggggt	ttcaccatgt	104580
tggtcaggct	gatcttgaac	tcctgaacct	aagtgaacca	cctgcctcgg	cctcccaag	104640

-continued

tgtctgggatt	acaggcatga	atcaccacac	ctgacggcat	gttattttca	tcgcaaaagt	104700
actglaagct	gggagaagtg	gcacacactt	gtactcccag	ctactcagga	agcttaaggt	104760
gagaagattg	cttgagccca	ggagttttga	gaccaacctg	ggcaacacag	caagacccca	104820
gtcnaaaaca	agaaaaaaag	ttattgaatt	ttttatttct	atggatcatt	ttttgtagt	104880
tcttattcct	ttcacccctc	atccccactt	ttgatcccat	cttttattta	tttagtttta	104940
ttaaatgtat	atttgtctga	taattctgct	atctacagtt	ttttgtggac	ctgactcagc	105000
atttctttgt	ttcttoggat	tcagaactgt	ggtggcttgt	gatttttagtg	atttttggcc	105060
gtgaacatgt	ttcttggaot	tttgtctgtg	ggaattctct	gtgtactctg	tataaatata	105120
gttaacttcag	gtgtttttga	ttttcttttg	ccatgcacct	ggggcctggg	tcactacctt	105180
tctggtaoca	cttaaaaactg	aatttttgtc	ttgggtgctc	gtactgatcc	tgtatgagta	105240
caagtttata	cttactgtag	aaatatgggt	tttgatttatg	gggtattgtc	ccagatgggt	105300
ctggagtatt	aatatgctct	ctgttaaaact	taatgtgttg	tccttgtaaa	actocaaaat	105360
ttgaatctcc	agaatactac	tggccccaaa	tglttaagat	aagggcactg	cttgtatttg	105420
ttctgtcctc	ccactatttt	ccttagttta	acacaaaactc	acotttttaa	aaaaactttt	105480
gagagaaatc	agtattggga	agagtttcta	acctgtttct	ggaaatggaa	gtccaaagt	105540
tgtttctgta	attgtttttt	ttttgagatg	gagtctcact	ctgtcaccca	ggctggagtg	105600
caatgacgta	ctctcagctc	actgcaacct	ccacctcccg	ggttcacgag	attctcttgc	105660
ctcagccccc	tgagttagctg	ggattacagg	tgcaccacac	catgcctggo	tgatttttgt	105720
attttttaga	gagatggggt	ttggccatgt	tggccaggct	ggtcttgaa	tcotgaottt	105780
gtgatctgcc	ccactcagcc	tcaccaagtg	ctaggattat	gtttctgtaa	ttgtaataca	105840
tttattgttt	ttagaacactg	cttttgtctt	agtggtaatt	ttcaataaaa	atagaatatg	105900
cagtggagtt	attaaaaagag	cattagttaac	atttttccct	ttttcattat	cttcaaatat	105960
tatatatagt	aagtttgacc	tttttaaaat	gtataacttgt	atcagtttta	acacatacat	106020
agatttoctgt	aactgtccac	actataaggg	taagaaacag	ttagttoott	caoctttgaa	106080
gtcaagcccc	acctctatcc	caacacttgg	caaccgctga	ttttctcccg	ttctaatagc	106140
tttgccctttt	ctcttttttt	ttcttatttt	tttttttgag	acagcgtctt	gtctgtctgc	106200
ccagctgga	gtgcagttag	gcaactctcg	ctcaactgca	ctccgcctcc	ctgggtccaa	106260
gcagttctcc	tgccttagcc	tccttagtag	ctgggtattat	aggcacgac	caccacaccc	106320
ggctgatttt	tttgtatttt	tagtagaaat	gggttttcc	catgttggcc	aggctggctc	106380
caaaactcttg	acctcaagtg	atccacctgc	ctcggcctcc	caaagtctgt	ggattacagg	106440
ogtgagocac	tgtgocaaat	caggactttt	tttttttaaa	tttaacattca	acttgtcaat	106500
ttttctctgt	atggattgtg	ccttcagagt	cacacctaa	agccctttgc	ctaaagcaag	106560
gtcatgaaga	ttttctcata	tgtttccttt	taaaagtatt	gtggttggcc	agggtccatt	106620
gctlatgcct	gtaatcctag	cactttgaga	agctgagggt	ggcagattac	gaggtccagg	106680
gatcgagacc	atctctggct	atgcggtgaa	accccatctc	tactaaaaat	acaaaaaaat	106740
aaaaaaatta	gcccggcggt	gtggcgggca	cctgtagtcc	cagctacttg	agaggttgag	106800
gcaggagaat	agtgtgaacc	cgggaggttg	agcttcagct	gagccagat	cgccccactg	106860
cactccagcc	tggggcaacac	agtgaactc	catctcaaaa	aaaaaaaaaa	agtattatgg	106920

-continued

```

ttttacactt tacgtttaga tatatatott ttttgagtta atgtogtata agtatgaggg 106980
tlaacgcaga ttttttggllt ttgtlltatl tttaacatag galglctagl tglctlaata 107040
ccatttgttg aaaagacaa ctttaactoca ttgaattgco tttgtacttt tggcatattt 107100
gttagggoot gtttttggac tcttttttct gtttcaatgat gtgtgtgtct attcctttgt 107160
laataccaca tgggtcllaat tactglatag taagtottaa aatlgggtaa tgcgtggoot 107220
ataaaacgaa ttgggaagt tttattttta ctcttatttc cattttctag aagagattgt 107280
gtagaattgg tgcattttot tctttagata ttgggttgaa ttgggaagtg atgcoactcg 107340
ggcctagggt tttgtttttt gtgtgtgaga cagagtcctca cttctgtcac ccagggttga 107400
gtgcagtggg gagatcttgg cttaactgcaa cctctgctcc ccagggtcaa gttatcctcc 107460
tgcctcagcc tcccaaatag ctgggattac aagcgtgtgc caccatgccc gactaatatt 107520
tgtattttta atgcagacag ggtttcacca tgttagccaa gctggtctcg aactgtgac 107580
ctcaagtgat tagcccaact tggcctccca aagtgttagg attatagatg tgagccaccg 107640
tgcclggcag gggccolagg ttttctttt cagagtattl taaactatga attcagatla 107700
tttaantagat ataggactat ttaagtatac tgtttctctc tgagtgaatt tttactgtag 107760
tttatggoot ttgagttaatt aattgtattg aattgtcaaa tttatgagcg tgaattattt 107820
tatagcattt cgggtttgta gtggtatccc tcttttatto ctggtgttgg caattgtgct 107880
ttgtttttct ttgtcagatt gtatagggat ttattagtct ttcaaagaa ctagcttttg 107940
tttggatttt togtllgill tglillcaal ttattgall ttctgtclll lallalllot 108000
tttotattat ttctgottgc ttgggttta ttttactctt tttttttct ccaagttgct 108060
taagatgaa accatagatt ctggtttgag acctttcttt tctaagataa gcaatttaata 108120
ctgtaaattt cctctcaacc actgclttag ttacaccccc acaaattclg gtattttgaa 108180
ctgagacaaa atgaaatgtt ctaatttccc ttgaattcta ttcttttacc aatgaattat 108240
ttagaatat gttatttagt ttgcaagcaa ttggagactt ttttctgtt attttctac 108300
cattttatto tcaattcatt atattatggt cagagaatat attttgaatg atttcattta 108360
ttaattttta aaaaatacat taaaaaattt tttaaatgt gaataatacca catcacgtat 108420
aaegattgla cactctgttt ttggacagtt ttctatnaat gtaagttga tttagttggt 108480
taatgatggt gtccagtttt tctttattct tgcgtatact ttgatatcag ttatatcact 108540
ttattactca gaagagtgtt gaactttcca actacaattt ttttttcaa ttttacttcc 108600
agctctatct ggttttgctt catgtatttt gaggtctgtt tgttaggtgt gtacacatto 108660
aggatgatat cttctgggtg aattgcctgt tttatcatta tgtaattccc tctttatggt 108720
aatttlcctt gllctlaagat cagaaatato tgttgiccaa ttlatataga caactgcagt 108780
ttcatttgat tagtgcttgc atggcatato tttttccatt tttttacttt tgatctacct 108840
ttataattct atttaaaggg ggcctcttgt aggcagcata tagttgggta gtgtatttta 108900
tttatttatt talttaltla ttalttatl tattgagaca gagtlltgol ctgtllgccc 108960
aagctggagt gcaatgggtg aatcctgggt taccacaaac tccacctcct ggggtgcagt 109020
gattctcctg cctcagcctc ccaagttagt gggattacag gaacgcgcac catgctctgg 109080
tgattttttg tatttttagt agaaaaggat tttcaccatg tttagccaggc tctgtttgaa 109140
ctcctgaact cagggtgac accctgcttg gctcccaaaa gtgctgggat tacaggcgtg 109200

```

-continued

agcoactgca ccggctgag tcatgttatt tttaatcttt tctcacata cagggttttt 109260
 gtltggtaaal ttaattalitt laataaaaal tttagtataa ttatttacaat laaatgtaac 109320
 tgttgcaactg ggggtatttat aatgtgtaaa tataattatt ggtattaata taattatat 109380
 actcataata atattaatat ctttggaattt agattaccag tttagtatat gtttttctgt 109440
 ttctccctct ttgatttccc ctttttttgt tttttttttt ttttaattct tatttttttt 109500
 tagtattttgt tgatcattct tgggtgttct ttggagaggg ggatttgga gggcatagg 109560
 acaatagtgt agggaaaggtc agcagataaa catgtgaaca aggtctctgg ttttctctga 109620
 cagaggaccc tgcggcccttc tgcagtgttt gtgtccctgg gtacttgaga ttaggggagt 109680
 gtgatgactc ttaacgagca tgcctgcctc aagcatctgt ttaacaaagc acatcttga 109740
 ccacccttaa tccatttaac cctgagtgtt aatagacat gtttcagaga gcagggggtt 109800
 gggggttaagg ttatagatta acagcatccc aaggcagaag aetttttctt agtcagaaac 109860
 aaatggagt ccccatgtc tactctttt taccagaca cagtaacaat ctgatctctc 109920
 ttcttttccc ccacatttcc cctttttcta ttgcacaaaa ctgcacatgt catcatggcc 109980
 cgttctcaat gagctgttgg gtacacctcc cagacggggg ggcagctggg cagagggggt 110040
 cctcaattcc cagatggggc agccggggcag agcgccccc cactctccag acggggcagt 110100
 ggccgggctg aggcgcctcc cactccctc ccggtggggg cggctggccg ggcggggggt 110160
 gacccccac ctcctctccg gacggggcgg ctggccgggc gggggctgac cccccacct 110220
 cctcccagat ggggcggcgg gccggggcgg ggcctgcccc cactccctc ccggacgggg 110280
 cggctgcctg gctgaggggc tctcacttc gcagacgggg cggctgcctg gccgaggggc 110340
 tctcacttc tcagacgggg cggccgggca gagacgctcc tcactccca gatggggtgg 110400
 cggctgggca gagacactcc tcagtlccca gacggggtcg cggccgggca gaggcgctcc 110460
 tccatccca gagggggcgg cggggcagag gtggtcccca catctcagac gatgggtctg 110520
 cgggcagaga cactctccac ttcttagacg ggtgggcagc cgggaagagg tgcctctcc 110580
 ttcccagacg gggcgccctg tcagaggggc tctcacttc ccagacgatg ggcggtctag 110640
 cagagaagct cctcacttc cggacggggg ggcggccggg cagaggctgc aatctcgga 110700
 ctttgggagg ccaaggccag cggctgggaa gtggaggttg tagggagctg agatcagcc 110760
 actgcactcc agcctgggca acatttgaca ttgagtgcag gagactcgt ctgcaactct 110820
 ggcaactcgg gaggccgagg caggcagatc actcggggtc aggaagtcca gaccagccc 110880
 gccaacacag cgaaaccccg tctccaccaa aaatgcaaa aaccagtcag gtgtggcggc 110940
 gtgcgctgc aatccaggc actctgcagg ctgaggcagg agaatcaggc agggaggttg 111000
 cagtgagccg agatggcggc agtacagtc agctcggct ttacaaact ttgtggcalt 111060
 agaggagagc cggggagagg gagagggaga caggggagag cccctttttt gctttctttt 111120
 ggattatttg aatttttctt taaatttatt tatcttactt atttatttat ttttttgagt 111180
 gailctcccg ccacagctcc caagtagcgg ggaclgcagg calglccac tacaccagc 111240
 taattttttt gttatttttag tagagacagg gtttcccat attggccagg ctggtcttga 111300
 actcttgacc tcaagtgate cactcgctc ggctcccaa agtgctggga ttacaggcgt 111360
 gagccacat gccctgcctt ttctagaat ttatatattg agttcttgat tgbatctttt 111420
 tatgtaggct ttttagtggc ttctctagga attacaatat acatactttt cactgtgac 111480

-continued

tcacatttaa	tattttgtaa	cttcaagtg	aatgtagaaa	acttaaccac	catanaaata	111540
gaactaggga	tgaggtlaaa	aaagagagag	aaagagaatg	taataaagal	ttaataacac	111600
cgtttttttt	tttttttttc	tttttttttt	gagacagagt	ctctctttct	gttaccaggg	111660
tggagtgca	tggcgtgac	ttggctcaact	gcaacctccg	ctctctgggt	tcaagtgttt	111720
clcttgctc	agcctaactga	gtagclggga	ttacaggtgc	gcgccaccal	gcccagclaa	111780
tttttgtatt	tttagtagag	acggtttcac	tgtgttgccc	aggatggtct	cgaattcttg	111840
acotttgtat	tcgtctctct	cagcctccca	aagtgtctgg	attacaggcg	tgagccaccg	111900
cgcccgcta	agtctttaa	tatttttttg	acattgcact	ttttctcttt	tcctcttagg	111960
attttagtaa	cccaaatgtt	agttttgtta	ttgtttggca	ggttctctag	gotttcccta	112020
cttctttaa	tttttttttc	ctgttgttca	gcttggaaaa	tttctattca	ctgtcttca	112080
aattcactgg	ttctttcccg	ttatttccat	ctgttatttg	agtctttgta	gtgaatttta	112140
aattttgttt	attatgtttt	ttagttctaa	aattttcttt	ttttgtgtat	gttattactt	112200
tlgtctclga	aactcllalt	tgtttcagga	gtgatcttal	ttcttagagc	atggttttag	112260
tagctactta	aaatttggtt	tatcctccca	gcattatgtg	ctctttgatt	gtttttcttc	112320
ttgtgagata	atggggtttt	ctgggttctt	atatgcacat	taattttgga	ttgtattctg	112380
gacagtttga	cttacgttac	atgattctga	atcttggtta	aatcctgtgg	aaaatattga	112440
agtttttgt	ttacaacga	gttgacctag	ttagggtcag	tcacacaaat	ctaagcagca	112500
llctgtggcg	ctgtgllcca	tcacagttc	agttttgtal	cttatctgcl	tatgtgcttt	112560
ctgtgttcca	gtctgggacc	tggtccaatg	tcagggtcca	aagcctttgt	acacttttag	112620
aagcagggcc	atgcacaccc	agctcacgag	tggtcccggg	agtgacata	caactcgacg	112680
llttcatagg	ctctctcttt	ctgtgtatgt	cctgcacag	ttctgccttc	taagaacctc	112740
cttttatccc	ttctctgttg	ctgtgctaga	aagtcagggc	tttagattcc	ctatacttca	112800
gcacacttcc	tgtagctatg	tcaacctctg	tggtccacgac	ttctctctct	tgggactgca	112860
gtttctcttg	tcagaaagta	ggattcttgg	agctgtctgt	attgctgctg	tggctgctct	112920
gatgtgctct	gggagtcgaa	ggagagaaag	gaacaaacaa	aaacaaacaa	gggattttcc	112980
tcacactctct	ttgatccgtg	agagccacct	ttctgtgtcc	tcagaccaga	aatagagggc	113040
ctgtcttggc	actctctctt	tgctcatctg	gtgtgcagtt	tcagcttttg	agtcaggccc	113100
aggaggtgct	ggacaaactt	gtcaggagta	cggaggtact	gcaagtctct	attactcttc	113160
tcagtcaccc	tgcttccaa	tccttggtatg	catttgtcca	ttgttttgag	ttgcattcca	113220
tgggagagac	agaagagtgt	gcttatttca	ctttgacata	cttattagga	tttcatacca	113280
aatcaacgga	tgatallctc	tatalaaatt	tgctgttttc	cctttagcaa	gcacattagg	113340
aaaataacac	tttaaacacc	gcctttgggt	gtttctgtca	taattattaa	tacttgactt	113400
tttttttttt	tttgagacgg	agtcctcact	tgctctttga	ggcattgtcc	ccataaacct	113460
llggtaaagc	atcaalaatt	ttatclttca	tcacacaaag	cttcaccala	aatttgatgt	113520
ttattcttcc	attttagcag	aattcatggt	gctccaatag	gggctgtctt	caaacctgat	113580
ttttctctct	cttagtgctc	cagagtagat	cctgttcaga	tacgttataa	cagggttaata	113640
tgagtttatt	ttggtgtaaa	agtactttga	aattcatgca	tagtttttcc	atcatatgca	113700
ttttccatag	ctttgaacac	cccatgttaa	ctctctctct	ccacaaacca	aaacatgaaa	113760

-continued

aagcaccctt gtgatggaag ttatttttgc aataggaact cacagtgate taagccctgc 113820
tattcatgaa tataattcat taccggaglc caagtlgctt ttgggttttl gaagtlctct 113880
tcttcctctg cagggtataga acaagatgca gtgaatactt ttaccaataa tatatctcca 113940
gatgctgcta aaccaataac aattacagaa gcaatgagaa atgacatcat aggttaagaa 114000
tgcttgaac tatggcaaaa aaaaaatgac aaaaaatgca cagaactgac aattttogtt 114060
attgactaag ataatttttt cttaacatcg aatttagcag ttcctctcct aatttgcttt 114120
ctgagtattt ttatatatcg attatagctc actttsaaag ttctctgggt gcattcggtg 114180
cgagggtctt tgctctgggc agatgggctg cagtgtagcg ggtgctcagg cctgccctgt 114240
gtgagcagc cgggccggcg ggcggctacg ctaaccggca cagaccaccg gatggactgg 114300
cggcagccc cgcaccagtg caccgaagtgg gggggacaga aacttctggg gttggaagtc 114360
cagtggagct aaaagccggt accaaagtct ctaggcatca gggctgcagc ccaagagtct 114420
cagcaccagt gggcaactgg atggccagac aggtgtctca gtgtgggct ctcggtctca 114480
gggtlctalc ccacllctca glgggcclga cglccclggg caccclggal gtlactctgc 114540
attagccaga gccatcacat ggcctgtgac ttgccttttt ttgccagttg attgtgccac 114600
acacagtgct atttctgtgt catttggcac agctggaggt gcaaggagga gggcagcctc 114660
atgtccagtc ccagttttac gtaactttat tcttctgaat aaagacaatt tgctaacctt 114720
aaaaaaaaa aaaaaaaaaa agtttttctt atatgttgga ccaaatctct taggctttaa 114780
cclgaalac aatgacagca agalcaalaa ataglacaca ttalalaaac actcactgtg 114840
tcccagacaa tattccaagc actttttatg gatagactca ttttaacttc taaagaacct 114900
tgtgggataa atacagttat ttatatagatg aagaaactga agcacagaga agttaagtgc 114960
tltgtccagg gtaacagctc agatalggca gagtccaggat ttgaaactag acctccacat 115020
accttaactg ctgtgctgtg gcagtgtttt tcatactgta ggttgggacc agccttctct 115080
tatgcctca cccctgcga aaaaaaaaaa aaaaaaaaaa aatatatat atatatatat 115140
atatatatat atatatatat aatatatata tatataaaat atatatatat ataaaaata 115200
tgtattagta tatatgcata tatagtatat attatatatt agtatatata ctatatata 115260
atctccatct tagtgtgtgt atatatatat atactagaat acaaatatca aagtatctca 115320
gagtgttaag gacaaacatt tcagaaaaat gttttcatta tatatacatg tatgtatgtg 115380
tatgtgtatt caacaaatat atttcttata ggttatagca aaatagtttg aaagctttta 115440
ctgtgtttta tcaggaagac cttaggtgaa cgtatatcca cagataaaag aggttattta 115500
ttcatcfaat aaatattaca ttctcataag tctaatatt atgtattttt attcttcaa 115560
aaagtlagla ttgttgattt atgaalaaag acatgtlctt gcacttttag cagatctgtc 115620
ccgagtgttg gcttctttta tctctagtgt ggtgtgttg cactcactca ctgtggggg 115680
cagcaagacc cctgttagtc tcagctgtgt ttcttaaat ggcccaactgt accttcagt 115740
tagctallct ggggtccatg tcaigtggc tccalltcc ttltctllct cccacacaga 115800
tacotataac ggtatataca taggcctggt ggtgtgtgt ggttatccc tatctgctt 115860
tatttaaggg gtaactgttc actgagttt gctgacagat gttgtcatga gatttgaggt 115920
ttctgtgtt gttgctctat ttttatgttg gaatttgcta ctatcatcat cctagacca 115980
gcttttccca gtaatacaac agggatgttc tgactgatta gagtttgct gtttgaagaa 116040

-continued

tttggttggt	agtgattttt	ttttgagggg	agtctgtacc	agttaatagc	ctgactggcg	116100
tgiggataaaa	aaggaaagcag	tttcaagltca	aataaaaacac	tlaaaatgaa	accacactlge	116160
aactctctctt	ctttacttta	agcttaaatca	aattaatgat	gatgtaatcc	catgaaggaa	116220
aagtctctctg	aaggatcaag	ttgataacat	tttgtgtatca	aagaatttga	gaaaaactct	116280
aloccagtg	ctatcattat	atatllliagg	atgtlaatta	cctgtgtggc	tttaggcaag	116340
tcatttttcc	tccttgagcc	ccattcttaa	tcctgtccaa	attatttgtc	tcctcttgca	116400
gttggaactat	tttaatatag	ctgtccttca	agtgagtttt	gttcaaaagga	gccttcactt	116460
tagctcttac	tgtgtaccca	ctttgcatag	ctctgtttta	aatgtaatcc	ttggattttt	116520
ggtgttgcta	actaattact	gtttttatgt	gaggatttag	agtgatccag	aatctatact	116580
tgactacct	ccttcacttt	ccacaaatgt	ttgaagtgg	agaattttla	aaaaacttla	116640
aggtacagct	gacagaattt	gctgatgggt	tggaagttag	tggatgaga	gggaaaaaaa	116700
ggaataaagc	atgactgcat	tttttgtttg	tttgttttgt	tgtttttgag	acggagtctc	116760
actctcgcca	ggctggagtg	cagtgccgtg	atcttggtc	acggcaacct	ccgctctctg	116820
ggttcaagcg	attccctctg	ctcagcctcc	caagttagctg	ggactacagg	cgctcgccac	116880
caagcctggc	taattttttt	tttgtatttt	tagtagaaac	gggggtttcc	cgtgttggcc	116940
aggtatggct	ccatctcctg	acctcatgat	ctactcacct	tggcctccca	aagtgcctgag	117000
gttacaggca	tatatataag	catataaagt	gtgttatagc	atacaaacag	gtatatatat	117060
aaacatgcag	tcacacacagc	tgataggaa	gaggcagtag	tgaaggagaa	gltgatglag	117120
gagaggggac	agttgtttaca	ggaagaag	ctggaggcag	aagggatgaa	ttccagtgtc	117180
cacatagaag	attgctttaga	tgggagcaag	gacattttat	ctagagtcc	aggaagaat	117240
gcagtacacg	ggtagagatg	caggtagatt	gaaagatgtg	agagatgalg	gaaataattt	117300
tcctgattgct	tcctattctc	caagggaagca	ggaaagcaaa	tcctcagcaa	agagaataga	117360
agagggttta	aattatttgag	aaaggagatg	tactgtagaa	aaaaaaaaaa	ctcagtttct	117420
ccttctgaac	tcctcacaaaa	cagaaccttt	ccatgactct	agttgtgtgg	ggttttttcc	117480
ctgtcagcta	ccattctctg	agatgattgt	tcagtgaaca	ccaactgggt	gtctctcaag	117540
tcagttcagt	tctcacactg	tttaacttga	gatagcatca	gatccacacg	attgaggact	117600
ctgtccccaca	agactgcctc	cacttcagat	gccagtctca	agtacaagt	gtggcctgtg	117660
ctctgactg	acctctcata	aattggagtt	cccacagtc	cctccttggg	ttcataaat	117720
ttgtatagag	agctctcaga	actcaggga	atgctttaca	tattatttacc	cattttattat	117780
aaaggatatt	acaaaggata	cagattgaac	aggcagatgg	aagagatgca	tgggcaaggt	117840
algggagagg	ggcacagagc	ttccatgcac	cttccaggtc	algccacct	ccaagaacct	117900
ctacagattt	agctattctag	aagccccct	ccccattctg	tccttttggg	ttttttgtgg	117960
agacttcatt	atataggcat	gattgatcat	tggctatttg	tgatcagctc	aaccttcagc	118020
ccccctaccc	cgggaggltg	gtgggtlagg	ctgaaagtc	caaacgtgla	attctgcctt	118080
ggtctttctg	gtgattagcc	ctcatcctaa	agctctttag	aggccacagc	cacaagtcac	118140
ctcattagac	ttcaaaagaa	tcacagagatt	ccatgaattt	taggcgctgt	atgctaagaa	118200
actggcctaaa	ggccagttgc	aatgtctcag	gcctgtaatc	ccagcacttt	gggaggctga	118260
ggcaggagga	tcgtttcagg	ccatgagatc	aaaaacagcc	tggccaacat	agtgagaccc	118320

-continued

cottacaaaa aatttaaaaa ttggccaggc gtaatagctc ttgtctgtag tctcagctac 118380
 tcagaaggct gaggatcaact gagccctgga gttgaaggca gcagtgagcc atgacgttgc 118440
 caotgactcc ggcttgggtg acaaaagtgc accctgtctc agaaagaaaa ggaaaaaaa 118500
 aaaaactgggc aanaactaaa taacatattt cacagtatca cagatttgta ttgtctagga 118560
 aagtgaatgt aaacagacca ggacactagt atgacccctt ggtttcatga aggtcccaact 118620
 aaagtcatga acacaaagtgc agactaggca tcatgtttata tggtttttcc agccatgttt 118680
 aacagctagc taatatagcta atgttttctg tgcagtttat tttagcagtt ccttatttta 118740
 gcacatttca tgttttaaaa ttctaccaa taacatttta ataaactttt ttacagataa 118800
 cttcacaaat ccataatttt ttaagttaca atcccagaaa tagaattgct cattgaaagg 118860
 gtatgttcoat ttttaaaagt atgctagaaa ctgcocaaatt gcttcagaa aaagggtgtt 118920
 gtatcccccac taacactagt gttagttttc ttgtgccctt gctcaagtat acatatattt 118980
 aaaaacaatg ttggggcagc ttaactagata aaaggtgtgag tgcctcotta ttctaactca 119040
 ttigtattact agtgagtagt tatgtctttt cacgttggto attttatgtt tgttcccttg 119100
 tggattgtca tgtcctttgc tcatttttct ttgggaacat ttcttagtag ttataaagag 119160
 ctcttgggat tttaagtata gtaacotttt aactgtctag catgctgcaa atctttttt 119220
 tgtttgtttg cctttgtatt ttgttttttg agggtttcta tgtataggaa ttaaatttta 119280
 tgttgttaaa tcttttgatt tctgcttttg catatgtact tcaaaagact ttctatttta 119340
 agatcaagtg ttacctgtat ttcttttag ttctatttaa aacctcttaa ttatatgco 119400
 tgtgtctgta aotcccaagt tgattccaa gtgtgtatac atagtttgaa tttagtggca 119460
 atttaattat ttaacacttc ttttgagca aggattttgt gagaagatgg acaggtggat 119520
 cccaactgtt tctgttttgc acagtccata gtcttttagt caatggagca agagtaagtt 119580
 agttcatatt ttacacattgt gcatcctagg gaatttgggt tcattgttag gaattgggctt 119640
 caotcagcta aaaaacaagt atttttgaga atttaaatat ttgggatatt tacaagatca 119700
 tataaagcat actctatctt ggttaacagt ttctttttaa tataaattat gtgaactctt 119760
 aaaaatttca ttttcaattt caatgttaat atttccctag ttaaaataat ttgtttttag 119820
 ttctgaataa atttggggag tgattgagtc tglagtgttt atgactatta gaattggttt 119880
 atttatttaa ataattgcag ttctcagatg gctctcctaa ttgttagtt aggccttaag 119940
 cttaantggat gctatataac taattccaca tagatttgtt gaantggctc cagagggttt 120000
 tttagatttat tactgctatg tgcctttaa aaaaacttat tcattcttcc acttaacatt 120060
 tatcagaaga gtgctctgtg taagacgtgg ttaggcatag tgcagctctt gaagggaagt 120120
 acagcctaatt aaaagacata gggcatgttg ttggtttact gtaatatgaa gtggcatgtg 120180
 ttaantgtca ggggagaact acaaaagtcat aaaaagggtg gagagattac atacagtaa 120240
 agganacagc aatgacacca tggggagtta ggtagtgttg acctaggcct ttaagataca 120300
 atagggacag tatggaaaga gtatattttt ccaacttaaa ctcttctctt ggtcgttccc 120360
 tcaaattttc ccttttgtcc atgtgcaggc accttaagtga gttctctgca agtcaccatt 120420
 tctgtaataa cagagattgaa gtgctgacca gtggaactgt ttaactgggt gaactctctt 120480
 tctgtgagtc agccctcttt tatctctctg aggtaaagtc tgcatttctt ttacactctt 120540
 attcagacat tccagctct aactataat gctggggccc tgtctatagg aataacaca 120600

-continued

gaagagccaa	gtcatttcca	aaaagatgta	tcattgttcc	aagttgttcc	tgatggcaag	120660
aglaatttaa	taattatalla	gagagacat	gaaaattcaa	tgatataaat	aactctaatt	120720
ttgagaaacc	taattaaact	actgcattgta	agagagtgca	tgtttttaat	tatttggagc	120780
tattttaaaa	ccacagaatt	tgaaacttgc	ttccagtgca	taaatgtcag	accagacttc	120840
agaagagaaa	aaaagtagta	aattttttct	tatgctcctc	atttttactt	tagtcaactg	120900
ataggattgc	ccagtggaag	agcatttgca	acagacaatg	agtatattaa	tctttttgag	120960
gcatacagtt	tagtataatg	ctctttgtta	ggcttcaaca	agtgaattaa	ttttgttgga	121020
aagcaaatga	ctattaaagta	gaagagggat	tccagctctc	acaaagcagt	aatttagaca	121080
ctcagattctg	cctctttaca	agaatacagg	tactcagttg	atttgttttc	tcactccctt	121140
tctttgtctat	aagttttaa	caacaatttg	tttaggttaa	tatgtcctca	tggaatggtg	121200
gaatgatca	gatataaaat	atttggtttg	gttagtttac	tctttatatg	tttgcctggc	121260
aggaaccaca	aatccagttt	agtataattt	ttaactctagt	tcactaaaag	tttgcataca	121320
gctgtgtagg	tagtgtttgt	ttctgtttaa	cttttttttc	gtctaaaaga	atactttaaa	121380
acttttcaat	ctcaaatgac	tgtaacttgc	tgacaggtgt	taacagaaga	agtagatctt	121440
tttgtttttt	gcttatgacc	tgtattttta	tatttgagct	tatagattag	agattgtgag	121500
agaaatctgt	ttatagtctt	attttccctt	gtgtattttt	tcttctagt	acatggaaaa	121560
agaggatgca	gtgaatatct	tacaattctg	gttggcagca	gataacttcc	agtcctcagc	121620
tgctgccaaa	aaggggccaat	atgatggaca	ggaggcacag	aatgatgcca	tgattttata	121680
tgcaagtga	gttatattga	tagatgggatt	cagcagatac	tatttgaaca	tttgatatgt	121740
tttgttgaaa	taaaagatgaa	taaaactcagt	ctctgtttgc	aaggagctca	caggaggcag	121800
cataaaaagct	gcttttatat	ggtgtttgta	aagctttggg	ggttcttaga	acaaaagtlt	121860
ctgctgggaa	agggggaggtg	tatgtggggt	aaacaggatg	gcaatgggtg	tgttcaaggga	121920
gtgtttccca	gaagagagat	tttgttttga	tcccaaaaga	agaaggggaat	tttgtatacc	121980
agagaaggca	gaanaacaca	ttctaggcaa	agggcattggc	ccagaagcca	tggaaacgta	122040
ggggaaagtg	gcactttcaa	gaaccttgag	tttagataat	caaggaagtg	gggaataaat	122100
atgaggatgc	tggtaactaat	tggaatagat	tgtaagggac	cttgaatgcc	tatttatggg	122160
tataattatac	ttctctgata	aatctgtcca	ggcacgttgt	taattagttt	ttttattagt	122220
ttcactgaaa	atgagaggat	ggaacatcca	tacagttaac	aaaattgaaa	atatctgggt	122280
aggcagatga	tgagcttttg	gccagctctg	taacgtatgg	tattcttttc	atttaacttt	122340
tcttactctg	taaaaaaaagt	aattcgtgggt	cgggcacgggt	ggctcaactcc	tgtaataaca	122400
acaatttgag	aggcagaggc	aggtgaatcg	cttgagccca	ggaatttgag	accagccttg	122460
gcaacatggc	aaaaccgcgc	ttactaaaaa	atacaaaaaa	tagctgagcg	tgatggcggt	122520
cgcctgttgt	cctagataact	taggggcctg	aggcagaaag	atacaactgag	ccttggggag	122580
tgcaggctgc	agtgagclgt	gatccactgt	acaccaacct	gggcagggca	gtagagtgag	122640
accctgtctc	aaaaaaaaaa	aaaaacaaca	aaggtaattt	gttatttgta	tcottaagca	122700
aatgctaag	gggttaacttg	gggatagaga	aaagtcacaa	gatgttaggg	tttgaagaca	122760
ctaatagtat	ctaggccagt	ggttccgtgaa	cattagtctg	tgggctcttg	ctgggctgtc	122820
tgcataggaa	tcacctgaga	gcttattaaa	aataggtttt	caggctgggt	gcggtggctc	122880

-continued

acgcctataa tccagcact ttgggaggct gaggcaggcg gattacttga ggtcaggcgt 122940
 tcaagaccag cctggccaac atgglaaaac cccgltctta ctaaaaatac aagaattagc 123000
 caggcatgat ggcacacacc tgtaatocca gctactcagg aggotgagga aggagaattg 123060
 ctcgagcccg ggnaggtggag gttgcagtga gcgagagatca tgcactgca ctccaggctg 123120
 gctgacagag ggagactctg tctcagaaaa aaaaaaaaaa atagggtttc agtcctgggt 123180
 ccggtggctc acacctgtaa tccagcact ttgggaggcc aaggcaggca gatcacttga 123240
 ggtoaggagt ttgagaactg cctggccaac atagtgaac cttgtctcta ctagaacctc 123300
 caaaaaatta actgggcatt ttgacgggtg cctataatcc cagctactag ggaggctgag 123360
 gcaggagaat tgcctgaacc cgggaggcag aggaactgcat ctcaaaaaaa aaaaaaaaaa 123420
 aaaggtttcc agtcccccgt tctcagaaat tctgattctg cagggttgag gtgtgaccag 123480
 gaatctttat ttttagaaga cataccagat aattctgata aatagccagt ttagggtagt 123540
 agtctaattt tcttattttg caagtaagga aataaaggcc cagagaggt 123600
 caaagtcaca gaacaagtta gtggcagaat ttggaactgga atgcagttct taatgttctg 123660
 tccagtgttt attctggtac agtatgtttg tagaaggatc tacgtaagaa acattgttat 123720
 atagatgttg agatagggaag agtttccatt tagaattttg gtcctaaaatg cctgnaacct 123780
 caagtctgtg aggagtattg accaacttac tcaatacaac ataggagatt cactttttgt 123840
 tacaaaaatg ctgattttaa aggagagttt tctttttttt cttctttttt attttttgag 123900
 alggagtctt gctctgtcac ccaggctaga gtgcagtga acgatctcag ctccactgca 123960
 cctccacctc ctgggttcaa gcggttctcc tgcctcagcc cctgagtag ctgggattac 124020
 aggtgggggc caccacggcc agctaatttt tgtattttta gttagagacag ggttcacca 124080
 tgttgcccaag gccggtcttg aactcctgac ctcaagtgat ccaaccacca ctgcctcca 124140
 aagtgtctgg attataggcg tgagccactg tgcccagcct gcttgttttt gtatcatata 124200
 tatgcatcat cataatcatg cattatcaac ctttgtattt ctgtcaggac atagaaacca 124260
 tttagagtct tggaagagag cctttttttt tttctgcgat ttaattgctt ttttggtatt 124320
 catttcataa tccagctaac aaacatttac ctgcattata ccccatcaag gtagaattct 124380
 ttgtgttata atatttggtt actcccttcc caccacgggt cctcagtaag tctgttcta 124440
 tccaaatagg ctatctgcat ctagtcaacc cctcagtgct gttttgtttt gaattgttat 124500
 atgtttactc ctgctgcctt gtagttatga tgatgtgttc ttattttatt ctgtgcatac 124560
 aagttctcag ctgccttttt agggaaaatg accatgtctt ccttccctat aaattccctt 124620
 ctatctatca agtccctaac agagaatagg taccataaaa tatgtgattg ttagttctt 124680
 tgcctcagtt glagctgat ccttacagct tttaaacca agtagagtlc accgtcaaga 124740
 actaagggatg gttggcaggc agatagaag gttagcaagtt gacccaacta tctctgggga 124800
 agtgggaaca agaaagggtt acatcagcac tgcctacaca tagctctata gttctaggcc 124860
 tgcaggctca atcaagtagc cttglalaag atctcttgga ggaggtgclg aaagttgctt 124920
 atacttgcta tggaatttga ttttacttcg gatattcttt taccataggt acttctccct 124980
 ccaagccaca catcctcttg gattttatga tgttgtacga ttagaattgt aatccaatat 125040
 ctgcagggaa ggtgggccac tccccactg tttcacaaact ccattacgtc aggcctggac 125100
 aacctggag aaggtaaccc agaacttcaa acgtatcaaa ctacaagaag ttttatttgt 125160

-continued

agaaactcata aaatataaagg tgggaaaacc aagcagaata gcacagtggg aattgaagca 125220
 glccagcaaaa glgattaaaga gcagaggcct tgagtcclgg cclgglatgla cagtcacglg 125280
 ccacataaca ttttagtcaa cagtggactg cgtgtacgat ggtcctgtac gattataatg 125340
 gatcaaaagt ggtagtgcna taataacaaa agttagaaaa aataaatttt aataagtaaa 125400
 aaagaaaaaa gaaaaactaa aaagataaaa gaataaccaa gaacaaaaca aaaaaaatta 125460
 taatggagct gaaaaatctc tgttgcccca tatttactgt actatacttt taatcattat 125520
 ttttagagtgc tcccttctaact tactaagaaa acagttaact gtaaaaacagc ttcagacagg 125580
 tccttcaggga ggtttccaga aggaggcatt gttatcaaaag gagatgacgg ctccatgcgt 125640
 gttactgcgc ctgaagacot tccagtggga caagatgtgg aggtgaaaga aagtgttatt 125700
 gatgatccctg accctgtgla ggcctaggct aatgtgggtg tttgtcttag tttttaacaa 125760
 acaaatthaa aaagaaaaaa aaaattaaaa atagaaaaaa gcttataaaa taaggatata 125820
 atgaaaaatat ttttgtacag ctgtatatgt ttgtgtttta agctgtttatg acaacagagt 125880
 caaaaagcta aaaaaaglaa aacagltaaa aagltacagl aagctaattl attatataag 125940
 aaaaaaattt taataaattt tagtgtagcc taagtgtaca gtgtaagtct acagtagtgt 126000
 acaataatgt gctaggcctt cacattcaact taacactcac tgcgtgactc accagagga 126060
 acttccagtc ttgcaagctc cattcatggt aagtgcctca tacagatgta ccatttttta 126120
 tctttttata tgtattttta ctgtgccttt tctgtatttg tgtttaata cacaattctt 126180
 laccattgca alagtggcct acgalattca ttalagtaac algtgataca ggtttglago 126240
 ccaaaagcaa taggtgtac catatagcca aggggtgtag taggcatac catctagggt 126300
 tgtataaagta cactctgtga tgttagcaca atggcaagca gccaaacgga aattctgttt 126360
 attgattgat tggattgttg attgattgag acagagtttc actccattgt ccaggctgga 126420
 gtgcagtggc acagctcttg cacactgcaa cttctgcctc ccagggtcaa ccaattatcc 126480
 tgcctcatcc tcccaagtag ctgggattac aggcaggcac caccatacct ggcataattt 126540
 tgtatttttag tagagacagg gtttcacat tttggccagg ctgtttctcga actcctgacc 126600
 ttaagtgtac tgcctgcttt ggcctcagaa agtcctggga ttacaggcat gagctacat 126660
 gcctgggcag taactgaact tctctaagtc caatttccct atctgtaaag tgacgataat 126720
 atgcacgttt accctcaagc tactttgatg attaaagtaa ggtaatgtat ataaaataca 126780
 tattaacata gtacctgaca catggttaagc atcaaaaaat gtttaactact tttattacta 126840
 ttattattac gtatttttaa ataattagag agcagtatca aaaattagct gggcgtagtg 126900
 gcctgcacct atagtccag ctactcagga ggcgtgaagc ggaggattgc atgagcctgg 126960
 gaattaaagg clgcagttag ccgtgttcat gccctgcac tccagccttg gtgacagago 127020
 aagacctgt cttgaacaaat taagaaggc attatgccgc aacgttagct tagaantgat 127080
 cccatcatat caccagtaac tgtcaacagg attggaaccc tagttttggg tattatgato 127140
 acaaggattt altaalagct lattaataat aaagcgltag claggcacgg cgaactacat 127200
 ctgtaatccc agcacttttg gaggccgagg tgggtggatc acctgaggto aggagtttga 127260
 gaccagcctg accaaactgg agaaacccca tctctactaa aaatacaaaa ttagccgggg 127320
 gtggtggtgc atgcctgtaa tccacgtac ttaggaggct gaggcaggaa aatctcttga 127380
 accggggagg cagaggttgc agtgagctga gatcgacca ttgcactcca gctggggcaa 127440

-continued

caagagcaaa	actcogtctc	aaaaatataa	ttataataaa	taataaaaag	taaagtattg	127500
atgtlgtga	atgattlalt	cttctaalg	actagaggag	alittlecag	gaattlcaga	127560
gccagtgagg	ttatgttgct	tgtatgtgtc	atgtgtatcc	aggtgaaaaa	acttaattaa	127620
acgtatttat	ataataccat	acataaaaa	tgaattttag	gaataotgaa	gaatgacata	127680
tagaagtcaa	atcattaaaa	agctagtagt	aaacagaata	gagtgtagc	tgttacccaa	127740
tgtatgataa	atttttcacg	ttaaaattaa	acctttttctg	attttaaaag	aaaagtccag	127800
atctgtatca	tataaagaat	gtaaattttc	agggtaataa	aattaaaatg	cagagagaaa	127860
aatgcaaaaa	tagttcttac	tagatgtgtg	tatgtaagg	acttagacta	attttaagaa	127920
cactgtcaag	accctggtag	ttaggttagga	aaaaagacat	gaatgattca	ttcaacaaaa	127980
acttttagta	tttctgtgt	agatggtagt	gttaacagtgg	taaacaaaaa	aaatgtgttt	128040
ctgtatctct	ggagcttagt	ctacaaaaaa	ggtacatatt	ggccgggcac	ggtggctcac	128100
gctgttaato	ctagcaactt	ggaagatcga	ggcgggtgga	tcacctgagg	tcaggagtto	128160
agagccagct	tggccaacat	ggcgaaaccc	cgtctctact	aaaaalacaa	aaattlaactg	128220
ggtgtgtgtg	cggacacctg	taatccacgc	tactcgggag	gctgaggcag	gagaatcaat	128280
tgaacctggg	agacagaggt	tcnagttagt	cagatcatg	ccactgcatt	ccagcccggy	128340
ggcnaaaagc	gaaataacgt	ctcaaaaaaa	caaaaacaaa	caacaaagcc	acgtattaaa	128400
tacgaacata	aattattaca	aattatactg	aataagttct	catgtttatt	atttgcttgt	128460
ccagtlacaa	actlltccit	cglagaalga	gaataalaaa	taataaacat	gagaactcat	128520
tcagtataat	taataattat	taaatgtaaa	taaaaacatc	tatgtacaat	taggcattta	128580
tttaaggaatt	atttgaaaaa	aaaacaatgt	ggaacacgat	attttgatat	attgctagtgt	128640
attgaaattg	ataatgttct	tttgaagagt	aaagtgaacca	tatatattaa	agtaaaaaat	128700
taactcagca	atcacacgcc	tggtgagtta	tcttaaggaa	atcagtttga	aagtaaaatc	128760
aatatatgca	caaagacttt	aacatttato	ataaacccaga	aaaatcgagt	ttcaaatatt	128820
atcctatgga	ctattttctg	ctaaaaagta	ttaatatcaa	ctttatgtaa	tactttctgt	128880
acaaatattt	tgggggagaa	aaacacacaa	aattacatgc	attgtaattt	tttttttttt	128940
tttttttttt	gacngtcttg	ctccagcgto	caggctggag	tgcagtggtg	caatctcggo	129000
tcactgcac	ctccatctcc	caggttcaag	caattctctc	gcctcaggcc	tcocagtagt	129060
ctgggattac	agggcgtcac	caccatgcct	agctaatttt	tatagttttt	agtagagagt	129120
gggtttcacc	atgttggcca	ggctggtctt	gaactcctgg	tctcaagtga	tcctgtctgc	129180
tggcctctct	agagtgtgtg	gattacaggt	gtaagccact	gcacccagcc	ttatgcatta	129240
taattttaat	ttglaaacig	tacaaaggga	taatacttgt	aglacacaaa	gaaglaaaaa	129300
caattgttat	aggtagttaa	catttgtaac	cagtagaatt	ataggtaaaa	tttattttat	129360
taaaaaggtt	ttagtgggat	ttgatttcaa	ctttaaaaata	atgcttttca	tctctatcag	129420
gtctllltgc	ctggctlllt	gtccagcaat	ctttattata	aalattltgaa	tgatctctac	129480
catcgcgttc	gaggagatga	atttctgggc	gggaacgtgt	cgtctgactgc	tcctggctct	129540
gttggccctc	ctgatgagtc	tcacccaggg	agttctgaca	gctctgcgtc	tcagggtattg	129600
actgattgct	tctgocatta	gggagaaaag	catacacatc	ctttccttca	catccacgta	129660
acagatccta	ttatttgttaa	attttaagtt	gtggaaaaaa	aagataaaaag	ccaggccacag	129720

-continued

tgccctgtgc	ctgtaatccc	agcactttgg	gaggctgcgg	tggggggatc	acacgaggtc	129780
aggaaatcga	gaccagcccg	gocgacatgg	tgaaacccca	tctctactaa	aaatacaaaa	129840
attagccggg	catggctggca	ggcacctgta	atccatagcta	cttggggaggo	tgaggcagga	129900
gaatcgcttg	aaacccaggag	gcagaggttg	caatgaacaa	aaatccagcc	actgcaatcc	129960
agcctgggtg	acaaagttag	actgtgtctc	aaaaaaaaaa	aaaaaagaga	gaaataaaat	130020
tagcctactt	actatcttct	aatcaaaagca	tttgtggtaa	cttaaaatat	actgtattgt	130080
aaagtatcat	gctgttctcat	ttagggcaatt	attctatttg	aatctgtggc	tgtttctctt	130140
aatanaatcaa	gtaatatgga	atatattcat	agcctctgaa	gagctcttta	tgtaaagtatt	130200
tattttagga	actttttgta	aaataagtga	atgaattctt	aggctctctt	ttttttcttt	130260
ttcttagaac	agggctctct	cgtgcgaacc	tggaaattct	gggtctaaaat	aatccaccca	130320
ccacagccctc	ctgaatagct	gggactagag	gcactgcacca	ccacgcctgg	ctaatttgaa	130380
attttttttt	ggccaggcat	gatggttccac	gocctgaatc	ccagcaattt	gggagacaga	130440
ggcagccaga	tcacagggtc	gggagatgga	gaccagcccg	gccaaactgg	tgaaaccccg	130500
tctctactaa	aaatacaaaa	attagctggg	tatggtggct	catgctgtga	atccacagta	130560
cttggggagg	tgaggcagga	gaatggcttc	aaacaggggg	tgggaggttg	cagtgcagcg	130620
agatcacgcc	actgcactcc	tgcattggtga	cagagtgaga	ctccatctca	aaaaaaattt	130680
tttttttaaa	tgatggagtc	ttgctgtggt	gctcaggctg	gtcttgaaac	cttgacctca	130740
aatgcgcgct	gcttcagcct	aagtttcttt	tttttttgta	aagagacagg	gtcttgctat	130800
gttggccagg	gtagctctca	actcctggct	tcacagcagtc	ctccacactt	ggcctctcaa	130860
agtgtctggga	ttacagcggt	gaacacactac	ctataatggt	gtgtttcact	caaggccctt	130920
tgatttcggt	ttgcattacc	gtgcacacatt	gtgcatttcc	ttgaactttt	ttgggttttt	130980
tggagtgctt	tcattatgta	aaccatacct	gattctctctc	aaaatcacac	aaagtagaat	131040
atcctaagac	aagaaatcta	aggaggcata	aagaagttaa	ctggttttat	taaacctcac	131100
cagtaaatga	tagagccaga	aatattcccc	ttctagtgtt	cttcaccato	agcttaattg	131160
agcataataa	ttttctcaatt	actgttgaca	aatcaataac	catttgaatt	ttcaatactg	131220
ggccttggat	aaattttctc	aatttgtaag	agagttattat	cgtattgcca	tttccaaaga	131280
tctcctgagt	atctttttct	tctgttaagt	ttacctagga	gataaaactgc	tgagtatggc	131340
tgccattttg	gttttttgat	ataggttaga	atgtcttggg	tttttttttt	tttttttttg	131400
gtttttgttg	ttgtcatgtg	ttgagacagc	atcttgctct	gtgcgccagg	ctggagtgca	131460
atggcacgat	cgtggctcac	tgcaacctcc	acctcccggy	ttcaagcaat	tctcctgctt	131520
cagcttctcg	agttagctgg	attacaggca	tgtgcaacca	caactggcct	attttttgtt	131580
tttttagtaga	gaaggggttt	caccatgttg	gtcaggctgg	tattgaaactg	ctgaacctat	131640
gatccacctg	cctcggctcc	ccaaagtgcct	gggattggcg	gcattgagcca	ctgcacctgg	131700
ctgaatgctc	tgtttttgat	taggcactta	agaaaggcct	aggtaactaac	cataaaatat	131760
atttttatcc	cttttttgga	tactatatat	atagaaaaact	gcacttatca	taaccttaga	131820
caacttgagc	aatgttccaa	agcagaacta	acccatgtga	ccacagcatcc	agatcaaaaa	131880
cagcattatc	agccctctca	gaagccctct	tgggccccct	ccattcaactg	tcctctcttg	131940
caccagggtc	gctactatcc	tgacttttga	tggcatagat	tagcattacc	tgtctctgtc	132000

-continued

atattataaa	taaaaccata	ctgtgtatto	ttttottgta	cagotttatt	gtgctaatto	132060
acatttacat	calacaalio	agtggttttl	atatggloac	agagtlaggt	aaccattlaco	132120
acatcgattt	tagaacattt	ttttcactcc	agatagaaac	cccttttact	taaaactccaa	132180
atcccccaet	ccacccagcc	taggagagcca	ctagtctact	ttttatctct	atagagacaa	132240
tagatttgct	tattctggac	atttcataaa	catggaaccg	tatatattgt	ggtcttttgt	132300
tgcacactgt	ctttcactta	gcacatgtgt	ttcaaaaagag	catcatgtta	tccatgtttg	132360
gcctgtatca	gaatttttatt	cctcattatg	gccccatato	ccattgcaag	gattttatga	132420
attttatttg	aattgtaccc	tctttctgtc	catttatcaa	taatgctact	gtgaccattt	132480
gtgtacaagt	ttttgtgtgg	atacagggtt	tctttttgtt	tttaaatgtg	agggtggagt	132540
ttgtctgtc	gcccaggctg	gagtgcaagt	gcacaatctc	ggctcactgc	aacctctgtc	132600
tctgtgggtc	aagcagttct	cctgcctcag	cctcccgagt	atctgggact	ataggcacgc	132660
accaccaagc	ccagctaatt	tttttagtag	gatggggttt	caccatgttg	gccagttctg	132720
ttctogaact	ttgacctcaa	gtgatccacc	catctoggcc	tcccaaaagt	ctgggattac	132780
aggggtgagc	cactatgccc	ggctgtgggt	ttcattttct	ttgttgtata	tacataggag	132840
tagatttgct	gagtcaagag	gtaaccttta	aacttatgtg	aaaaactgca	gattgttttc	132900
cgaagggtct	gcaccatttt	gcaatccacc	cagcagtgtg	tgagttttac	agcttctcca	132960
catttctatt	gaacttatta	tctgtttggc	tgttttttaa	aatgatagtc	attccaataa	133020
gttctacttc	agtlgggttt	ttgcacttct	ctgatgagta	atgalgtlga	gcactcttct	133080
atttgcttat	tggcctttgt	tctagctttg	gaaaaatgtt	tattcaaatc	ctttggccat	133140
ttttattttt	attttatttt	attttatttt	ttttgagacc	aagtctcact	ctgtcagcca	133200
ggctggagta	caatggtgtg	gtctcagctc	actgcaacct	ccgcctctct	tgttcaagtg	133260
attctctctc	ctcagcctcc	cagtagctgt	ggattacatt	tcaggcacct	gccagcatgc	133320
cgggtctgatt	tttgtatttt	tactagtga	agggtttcc	catgttagcc	aggctgggtc	133380
caaaactctg	acotcagggt	atctgctctc	ctaggcttcc	caaaagtctg	ggattacagg	133440
cgtgagccat	tgggcccagc	ctagattttc	ttttttcttt	ttttttttga	gaaggagttc	133500
tgtctttgtt	gcccaggctg	gagtgcaatg	gcacaatctt	ggctcactgc	aacctctgca	133560
tctgtgggtc	aagcgatttt	cctgcctcag	cctccccagt	agctgggatt	acagggtcct	133620
accaccacac	ccagctaact	tttgtatttt	tttttagagc	agggtttcc	catgttggcc	133680
aggctgggtc	caaaactctga	cctcagggtg	tccacctgcc	ttggcctccc	gaagtgtctg	133740
gattacccgc	atgagctaac	aggcccagcc	aattttctca	ttatatgtcc	caggctgggt	133800
tcaaacctct	gggtlcaagt	galcctctct	ccttggccct	ccaaagtggt	gggaglacag	133860
gcctgagcca	cctgtctcag	cccctttgcc	cattttttaa	ttagattgcc	tttttatatt	133920
gagtttcagg	agtcctttat	atattctaga	taaatgtccc	ttatcaaatc	atattatttc	133980
cagglatatt	cttctattct	tgagttgtct	ttcctctacc	ttttaaaaaa	gggtgggttt	134040
tgttttgttg	tttgttttgt	tttttaagat	aaggctctcat	tctgctgccc	aggctggagt	134100
gcagtggaac	aatcacagct	cactgcaacc	tcaactctct	gggcgaagt	gactctctta	134160
cttcagcctc	ctgaatagct	agggccatag	atacacacta	tcacaccacg	cttttttttt	134220
ctgtttgtag	agacagatct	tactgtgttg	cccaagttgg	tctcaaacct	taggctcaaa	134280

-continued

gtgattctcc	cacctctgcc	tcccagagtg	ctgggattac	agggtgagc	cacacgcac	134340
ctgctcttcc	actatttaata	gtgctcttcc	gcttcagcct	cccgagtagc	tgggattaca	134400
ggcaccacac	accatgcctg	gctaattttt	ttgcattttt	agtagagaca	gtgtttccac	134460
atgttcaccc	gggtgtgtct	gaactcctga	cctcaggtga	ttcactgtgc	atggcctccc	134520
aaagtgcctg	gattacaggc	gtgagcgaat	gcaccgggcc	aaaatatlga	cttcttlaaca	134580
gtattgtctt	ctaatttgtg	aacatggatg	tatcttcctg	tatttatgtg	ttctttcatt	134640
tcagcagaat	tttgtagtgt	tcagagtaga	agcctttcac	ctccttgggt	cattttattc	134700
tatgttttaa	gtctctttcg	attccattat	aaatagaatt	gttttcttaa	tttcattttc	134760
agattgtttg	atgagagagc	atagaaaata	aagtgttttt	tacatgttga	tottgcacat	134820
tcaactttga	taaatctgat	tgtagctctt	aatagttttc	ttgtggatto	tttaggattt	134880
tcaatatata	agatcatgtc	atttatggat	agagatagtt	ttttttctgg	ctagaaactta	134940
cagagcaaat	atgagtagaa	gtggcagaa	caaaaatctt	tgtcttggtt	cctatctgac	135000
agggaaagct	ttcagtttca	tcaatttaata	tgatgttagg	tgltgggttt	caataaatga	135060
cttttttcag	attcaggaat	ttccctatca	ttcctgattt	tttaaggctt	tttttttttt	135120
ttaaatcatg	aaagggtggt	gaatatgttc	atgttctttc	tgtatcagta	taaatgatcc	135180
tatggatttt	gggtttttat	ctgttgatgt	gaatatataa	ttgattttca	gatgttaaac	135240
caacotttga	tacctgagat	gaatctcaat	tggtcatggt	gtataatctt	ttcaatatgc	135300
tgctggatcc	caatttactg	tallttgttg	aagattttgt	atctgaacgc	ttagataaac	135360
atttacaact	tatcagaaat	gaattgacca	taaatgtgag	agtgatattg	tgggttcttg	135420
attctcttcc	attccaaaga	tagacataca	tccgtctgta	tgtctgtctt	tatgcacgta	135480
ccatactctc	ttgattacta	ttgctttgta	ataagtittg	aaatcagaaa	gtataaatga	135540
gatttttgta	tctgagtaac	agtcctcata	gaattagtgt	ggaaatatcc	cctctttatt	135600
ctggtccctc	tttctttttt	gtttaaatgt	gtatcttgga	gattgttctt	tctcaaacac	135660
tgagagccgc	tttccctacc	ctcccccacc	tgctatatag	aggctctata	gtgtctgttc	135720
aattattttt	tttaactaac	ctattactta	gtcggggaca	ttaaagctgt	ttatgtottt	135780
tatttttaac	aatgctgcag	tgaataatct	tgatataaag	tcatttttca	tcaatatagc	135840
tctctctgta	actgaatttt	tagaagtgga	atttctaggt	caacctatgg	ctctgtattt	135900
ccaaaaata	ccaatctctg	tttttcttgt	ggagggtggg	agtaggaggt	agaatgctgg	135960
aggagaaact	gctgtactca	gctggctagt	catttttaga	aggtttctct	agcttctttt	136020
tgctcatatg	cctcaccaag	aatcaaaaac	attcctattt	acctgtaaa	catggggctt	136080
tactaccoca	gatacatatt	ctgggatgta	tgacagcttt	tcatatlgaa	gaaataatga	136140
tgtaggtaca	gcacatttgt	tggaacttag	gtcgttaaga	atgtcttata	aattcatata	136200
ttatacaatt	tatttttatt	tattttttag	tttttgatac	agagtcttcc	tctgtccccc	136260
aggccagcgt	gcagtggtac	aactctggct	cactgcgacc	tccatctcct	gggtccaaat	136320
gattctcatg	tctcagcctc	cagagttagct	atggttacag	gcacgcacca	ccatgcccgg	136380
ctaatttttt	tattttttagt	agaaactggg	tttcaacata	ttgacacatg	tggcctcgaa	136440
ctcttggcct	caagtgtatg	gcctgcctca	gcctcccaaa	gtgctgggat	ccttgtattg	136500
ggtaaaagat	gaattattgag	ggctgcattg	tggtctatac	ctgtaatccc	agcaattttt	136560

-continued

gagactgagg tgggagagggt cctggagccc agggaggtga ggctgcagtg agttgtgatc 136620
 ggcgcattgc acctcaaccol aggaallata ggctloagtc actlgcccg gcatglacal 136680
 tttaatatbtg tgccttctctc ttttagctat agtatgaggt tacatttccag agtcaattgtt 136740
 gtttaagcctc ttaantegtga tgagggttgng tgaaggttac ttctatttca aacactgaag 136800
 aaaaattttgt acaaalctgt cacallicaa gccacggact gatlgtttca tatacttcta 136860
 attttacaat ttctattgta gtccagtggtg aaaaaagcca gtattaaaat actgaaaaat 136920
 tttgatgaag cgataattgt ggtatgggca agtctgggato cagaattttt atataacagg 136980
 acatatgcog ggtaagctta gctcatgcct agaattttta caagtgtaaa taactttgca 137040
 tcttttaaat tttttaatta aattttacat ttttttctaa tctattatta tatgccaga 137100
 actttcaact agagtgtga gtataaigtg gtggttaagl ataaaggcic tggagtgaat 137160
 tctctgggttt taactcttgc tctgccattt attggcagcc gctaacctct tggatatcta 137220
 gtttctctat ctgtaaaatg agaataataa agtgaaaaga tgccaacata atttactctg 137280
 ggolgoataa ctgatacttg gaaaaaglat tocttigagl ttaagaatta agtlggttat 137340
 tcattttagc ttgtaataaa aagatagtgga ttcataggat atgccactta ctgaaattta 137400
 cccagatccc aatcataaaa tcaactttctc ttccctaaag atagcttgat taacatgtan 137460
 aggtgtgtaa aggtctgatt acactaccct gatccgtacc ccagttccca gcagaccat 137520
 gaaaaagga tttcaacata ttttaattact ttcaagtagaa agtaacagtg gtaggccagg 137580
 ogcaglggct cacacctgta alcccagcac ttlgggaggo cagglgggo ggalcogag 137640
 gtccaggagat tgagaacatc ctggctaaca cagtgaaacc cagtctctac taaaaataca 137700
 aaaaatttagc cggggcatggt ggcaggcacc ttagtccca gctacttggg aggtctgagac 137760
 aggagaattgg cgtgagcccg ggaggcggag cttagcagtga gcttagatlg tgccactgca 137820
 ctccagcctg cgcagtgag cagagactctt gtctcaaaaa aaagaaaagt aacagtggta 137880
 ttgggagact gaggagccta gaaggtactt gaagggaagta aaaggtttgt ttgaccacat 137940
 tgtatttgga aagccagact tttoagctgt gtcagctttg ttagtgatt tttagtctct 138000
 cttttagaaa ataacggaca aggcggggca cgggtggctca cgcctgtaat cccaccactt 138060
 tggggggcog agccggggcg attacctgat ctccggagtt cagaccagc ctggggcaaa 138120
 tgggtgaacc cagctctctac taaaatacaa aaagttagcc gggcgtgggt gcgtgtgctc 138180
 gtagtccag ctactccgga ggcagaggca gggaatttc ttgaaccggg gaggcggagg 138240
 ttgcagtgag ccaagatcac accattgcac tgcagcctgc gcgacagagt aagactctgt 138300
 ctcaaaaaat aataataaaa taaaaagaa tggacagtaa acctaatga gttcattccc 138360
 aaagatgatg ttattttaa gggatggcto atttatttaa gacctacat aaagctctat 138420
 aattgctgta tttttcaatt ctgtaattgt gtgtatgtat aatgtaaaaa tatattgttt 138480
 tgttttgttt tggttttttg agacggagtc tgcctctgtt gctcaggctg gaatgcagtg 138540
 glgcaalcic agctctctgc aacctctgic tcccaggcto aagcgtttct tctgctcat 138600
 cctcccaagt agctgggaact acaggcacgt gccaccacgc ccggctaatt ttttgtattt 138660
 ttagttagaga tgggggttca cngtgtttag caggatggto tcaattctct gaactcgtga 138720
 tccaccogcc ttggctctcc aaagtgttgc tattacaggo atgagccacc acaccacga 138780
 tgtatttttt aaatgtataa aatgaagcag aaaaagagaa tgataatttt tcttcatctt 138840

-continued

```

gaagattat cttcaccagg cgcagtggt cacaactgta atccagcac ttggggaggc 138900
ctcggcaggc ggttcacllg agtlcgaac cagcotggcc gacatggiga aactccgtct 138960
ctactaaaaa taataaataa aagatggitt taatatatgt tttagtttta tgattttaga 139020
atctttctga aatttttctc aaggcaagta aatttgtatc agttgggtata ttggtaccca 139080
tcctatgaaat aacttattag gaagataict ctaaaataag atcactttgc ctaaaaataa 139140
ctgatataatt gatgttcaca gaatttttct tttaacccagc ttgataaatg cattattctt 139200
gacgtcaagt gatccacctt cctcagcctc ccaaaagtgtc gggattacac acatgagcca 139260
ccgcacctgg cattattctt ataaaagggtt aaattttctag ttaagtttaa tgcctctctt 139320
gttcactgtac cattgtctat tttcttccct tctactcacc agtaatcatt cttatgggat 139380
gcacttttgt ttgcttattt ttatgtaatt gatattacgc tccattctgt acgttgtact 139440
ttcattcaca gtgagttttg gacattccta tgttcactca tacagactta cttcatttta 139500
actacactgt agtatccctt atgtaataatt tactataact catcactgta gcagagcacc 139560
tcatagtgtg tgtattactg ttllgcattt ttggatcaca tgagtattta agtcatttgc 139620
agttttttcc tattataccc agtattacag aggatctctt tttatgtgt tctttgtacc 139680
aagaggccga taaaaaaatt tttttttgna aaaaattttt aaaaaaaatg aaatgaagtc 139740
tcactatgtt gccacggctg gtctcaaaact cctaggctca agcaatcctt ccatcttgcc 139800
ctcccaaaat gctgggggta caggcatgag ccaccatgcc tggcctacat tttaaaattt 139860
gatagctctt acaatttact ttglaaagta tctgcatcat ttatgttct caccagctct 139920
taataagaat aotcataact ttgggtcgga cacagtggtc cagcctgta atccagcac 139980
tttggggaggc cgaggcgggc agatcaagag atcgagacca cctggcccaa tatggtgaaa 140040
cctgtctctt actaaaaata caaaaattag ctgggcgttg tggcgccccc gtagtcccag 140100
ctactcgaga ggtcgagaca ggaataatc ttgaaccctg gaggtggagg ttgcagtga 140160
cttagatcac accactgcac tccagcctag caacagagtg agactctgtc tcaaaaaaaa 140220
aaaagaatac ttcagactta attttttttc cagtcttaag tgtttgctaa tgagattgag 140280
tttcttttgg tatgtctctt gattgttcag gttttttctt ttatgaattg actgttctac 140340
tcctttttcc attattcttg ttgggtgatt ttatlagtga cttgttanaa ttctgtatct 140400
tttttcagca tgacacttca ttattcaaaa aaaaaaaaag attctctatg tttctcgata 140460
ctaactcattg gttggtaata ccttaaaaat aagaccctta ctgtattttt tgcctttttt 140520
tttttttttt tttttttttt ttgagatag agtcttgctc tgttgcacag gctggagtg 140580
aatggatgta tctcggctct cagctcactg caactgcacc ctctacctcc ctgtttcaag 140640
caattctctc gctttagcct cccaagtagc tgggattaca ggcacccacc accacaccca 140700
gctaattttt gtatttttag tagagacagg gtttoacat gttggccagg ctggtctcaa 140760
actactggcc tcaagtgatc cgcctgcctc ggcattccca agtaactgga ttacaggcat 140820
gagccacagt gccatgccac tttltgcttl tlaactttgt ttatagtlac tataglttta 140880
gtataaacag atgtatgtat acacacaaat atggctttat aatatgttcc agtcattgtt 140940
agagcaaggc ctaccctttg ggtgcttctt ttcaaaaatt gctttggcta tctttgtgac 141000
ttttttctta ttgttgaatt ttgaattgt gaattacctg ttgactcacc atgttttgtta 141060
aactgaggat ttggaatgga attgcactca attaaagatt atcttgcttt ctgtgcagca 141120

```

-continued

atgtttttatt tcaataaatc cctactttaa attacttagg atagctataa attgtgttto 141180
 tggcttttcta gatttagalg aaacgcctta aaltgaltgt ttctccctaa atttaaaact 141240
 gattgttaga agttaaagtc ttctgttcac tcttatttag gaagatgaca ttgggaagag 141300
 taagtgaactt ggggcaattc atcggagant ctgagcctga aactgatgta aggaatacaa 141360
 aaggtttgtg gtgtttttat acttcataatt aagcctttac tcacattagt gattgactgt 141420
 aagtc aaaga ccacttaagg tttaaactgt ttatttttga aagtaaccac tgtatcttcc 141480
 aactgtgtgtt tatagtcaaga agtaagtaca aggggttccct gtagtcacac ctttatgcac 141540
 tctcctctga atcaaaagtt agtgaacttg ctttgccact ccagaaggca catgaatatg 141600
 aaaaagcatt gtctattttc ttattttaatg gcaaaatacc cgacctaagt tggacttaat 141660
 gtttgagacc gttattttta ttaaatata tttttctctt ttcttttttt ttttttgaga 141720
 cagttcttgc tctgtcaccc agacccgagt gcagtggtct gaccgcacct cactgcaacc 141780
 tctgttctct aggttcaagc gattttctct cctcactcct ctgagttagct gggactacaa 141840
 gtgcgcacca caacacclgg ctaatttttg tattttttag agagatgagg ttccaccacg 141900
 ttggctaggc tgggtctcata cctctgaact caagcaatcc atccgccttg gcttccaaa 141960
 gtgtctgggt tacaagtgtg agccacccatg cctggcctta ttaaatattt ttattttaat 142020
 ttctcaaga ttgatgaag taatgaata taaaagtaat gaatatatg tggaaaatag 142080
 actggttaa gaaaatgtg cacatataca ccatggatc tatgcagcca taaaaagga 142140
 tgagtlcag tctttgtag ggacatggat gaagctggaa accalcaltc tgagcaaac 142200
 gtctcaagga tagaaaacca aacaccccat gctctcactc ataggtggga attgaacat 142260
 gagaacactt ggcacacagg tggggacat cacacgctg ggcctgtcgt ggggtggggg 142320
 gctgggggag gaatagcatt aggaatata cctaataaa atgacagatt aatgggtgca 142380
 gcacaccaac atggtacatg tatacatatg taacaaagct gcacgttgtg cacatgtacc 142440
 ctgaactta aagtataata aatttaaaa anataaatat atgtggnaaa tattaatagg 142500
 tcaaaattca aattgttcat ttaatacaga gagtagttta gtcaaatcca agggttagac 142560
 aacagaaatc ttttttgtca agtgcattct ttgtgactga ttctattttc tctctgggtt 142620
 aacccgggaag atttcagaaa caaatgtgga tccgtgacag atggtatcta gaagttttta 142680
 gtttggttga attgacagta ttttatttag taaaagatac taatttttgt aagaagaaaa 142740
 attcaatttt gataagtatg ttttaagatta agagctattg gccaggcgct gtygctcatg 142800
 cctgtaatcc tagcacttg ggaagctgga gcaggtgggt cccagggtca agagattgag 142860
 accatcctg ccaacatggt gaaacccctg ctctactaaa ttagccaggc gtggtggcac 142920
 atgctgtgc acccgccctc ggglttaago galccactg cctcaggctc ctgagtagct 142980
 gggattacag gcgcacatgg taatttttgc atttttagta gagacagggt ttcactacat 143040
 tggccaggct ggtctggtct caaactcctg acctaagggt atctgccccg cttagcctcc 143100
 caaagtgtc ggatlacagg catgaticac catgtctggc catltaactt attttctttt 143160
 tttttttttt ttttgtttga gacggagtct tgtgtgtgct cccagagctg gagtgcattg 143220
 gtgcgactct agtctcctgc aacctctgac tccgtgggtc aagcaattct cctgcctcag 143280
 tcttccaagt agctgggatt acaggcgcgt gccaccacat ctagctaatt ttgtattttt 143340
 tagtagagac agggttccac catgttgcc aggcctggtc cggaaactct gacctcgtaa 143400

-continued

tctgcccacc	tgggctctcc	aaagtgcgtga	gattacaagt	gtgagccact	gtgcccagcc	143460
atcttatttt	cttctctttt	ttttgtcggg	tgggaggggg	acagagtcct	gctctgctgc	143520
caggcttgcc	tcactgcacc	ctctgcccc	caggcttctag	caattattct	gctcagcct	143580
ccccagtgc	tgggattata	ggcacctgcc	accacgctgc	gctaattttt	tgttattttt	143640
agtagagatg	gggttttgtct	atgttgacca	tgtctggctc	aagtgatcgc	cccaccttgc	143700
ctccccaaag	tactgggctt	acaggcgtga	gcttctattg	ggtaaaagaa	caatatctgg	143760
gggtgcactg	tgggtctatc	ctgtaatctg	agcactttgt	gagactgaga	tggaaaggct	143820
gttggagccc	aggagggtga	ggctgcggct	gcagtgaatt	gtgatcacgc	catttgcactt	143880
ccacctaggt	aattggagcaa	gacctgtct	ctaaaaaaca	aaacacattt	tttttaaggga	143940
atactgggaa	gaggtcagtg	gtggttttag	aacagaggaa	gtgccagatg	accttttgtga	144000
ggcattggcc	aggaaagact	ctacagtgct	tttaggtagc	ttctgtccat	aaggataaats	144060
gggtctctct	cccagttatta	atagaaaato	tctgagctgt	ttttttttgt	ttgtttgttt	144120
tgtttttttt	tcttgagatg	gagtcctct	ctgtgggcca	ggctggagtg	ctgtggcgcg	144180
atcttggctc	actgcaagct	ctgcctccca	ggttcacacc	attctcctgc	ctcagcctcc	144240
caagtgcgtg	ggactacagg	tgtccaccac	cacgcccagc	taattttttg	ttattttttg	144300
tagagatggg	gtttccaccat	gtcagccagg	atgggtctcga	tctcctgacc	tcgtgatccg	144360
ctgcctctgc	ccttgcaaaag	tgcctggagt	acaggcgtga	gccaccgtgc	ctggcctggt	144420
ttttttgttg	ttgtttatla	tttatttatt	tatttttttt	ttagagacaga	ctctgcctct	144480
gtgcctcggt	ctggagtgta	tgggcacgat	gtcggctcac	tgcagctct	gctgcacagg	144540
ttcagcccat	tctcctgcct	cagcctcctg	agtagcaggg	accacaggcg	ctgcaccaca	144600
cgcccggtca	attttttgta	tttttagaag	agacgggggt	tcaccgcatt	agccaggatg	144660
gtctcgatct	cctgatgtcg	tgatccgccc	acctcgccct	cccaaaagtgc	tgggattaca	144720
ggtgtgagcc	accgtgcctg	gctgtatttt	tttttttttt	taatttggtc	tcatacctct	144780
gacagctcat	gaagaagtgc	tctctgttca	tatgtatatg	tgttagcata	gtgttaaacat	144840
agcataggtg	ttcgggtgtt	gcagtctctg	tttgttttat	atgaatttaag	gtgtattatg	144900
agcagttgae	gatataatgg	aaattttttc	cccaaacact	atctctgctc	gttctatttc	144960
ttcagttcgt	ttattgttatt	ccttcattca	ttcatttttat	agaacagtgg	agtgctactc	145020
gtatgcactc	attgttctgg	gtcctgggga	agaaaaacaaa	gttctctgct	tcattggaact	145080
tacattatat	tggcggagac	agtaacagac	aaacaaatgt	agcctgtgta	catgtgttac	145140
atgaaaagca	gggtaggggg	ctgggagaga	gtagtaggga	gtgtattttt	cagagtggtt	145200
gtcaggaaaag	gctcactcga	ggaggtggca	tttttagtag	acctgagcgc	agcggggggg	145260
taagcccagg	cagcatctgg	aggaaagagt	ttcttgggtga	aaggaaacaag	gatagaggcc	145320
cgaggtcaga	gagctcagca	tgatcaaggga	acagcaagcc	cngtgtggct	ggaaatggagt	145380
gagcaaaagga	algagcagla	gaaggtgagc	gagtlgggag	gtcaccagag	accttggcaa	145440
ggacttgaag	gtgtcaggga	cacattggaa	gttggagcag	ggaaatgatg	ggattttatg	145500
tttgtttttg	tttttatgtt	agtgttttta	agggattgtc	ctatcagcta	tttggaanaa	145560
ttagtgtagg	gcttcaagaa	gagaagcaga	gaacaaacat	tcttgccata	gtcatagtct	145620
aagtaaggga	tgatggtggt	gtggattagg	ctggtagtgg	aagaccagtc	cagttcgggt	145680

-continued

```

tgtatttgaa ggtagaggca aaaagattat atttotacca gcaagcccat ctatgaagtt 145740
acitgtatta ttaattlaat tgagacatgc ccacataaac taataaatag gaattctctg 145800
agtttggtta aacacccctg tatatcctgg ttctctcttt agttgtccag atgtctcttt 145860
aagtcaagta ttttttggtg gtgtaggagc ctagagattg aatttattoa cccaaaaggg 145920
alltgagtga ttactatgig ccaggcacta tgotgaatgc caaggatgta aataagaggg 145980
cgtagtctca gctctgttta ctccagcttg gtctcttttt aatgacctg acttgtaaag 146040
catataagtt atctctacaga atgtttaato ttctgtactt tcttggttgt gttattttag 146100
ttattttctt ttctctgaca ttctctgtta actggaagtt acacctatag tcttgatgat 146160
tcgtgttaca cattttagat tagaacacat catgtgttgt atatggttgt tttgaaagcc 146220
tcctctgata ttggtctgta cattaaaatg ttgootgaat ggatacacat aaaatttaac 146280
agtatttaca tttagagtga gaagaagag gtgctcttta cttttcaata taccttttcc 146340
tcgtcttttt gaactttctt gccctatgca taagtatttg cttaatoato caactcatct 146400
cttccctgtl ggtcttctgt tgcatttggg atgaatctta gcccttttgc tgttaacctl 146460
ggatgtccct tgcctggctc tatcacctta ctttgaacca ctctttctat ggaactgagt 146520
ctcattggac tatcttttat tcttttctgt aagttttctt actttgagtg cctctgcagt 146580
tgctatttca tggctgtggc aagccctgcc atggctttca tgcaaggatg gttctctctt 146640
ctcatctcaa tattatctct tcagagaggg accttcccaa ctccgatgat ctaaaactct 146700
ttgtatatac cactcaactac cacttcltct ttttcltcto ctlttatctt tttttttttt 146760
tttttttttt gagatagggg ctgtctotgt tgcccaggct ggaatcaaga ctcaactgag 146820
cctcatctct ttgggtctaa atgatcctct cactcagcc tctcgagtag ctggaactgc 146880
aggaacacac caccatactt ggccttattt ttactttttt gtagagacag ggtttcaca 146940
aggttgtctt caagctcctg ccgcaagcaa tccacatctc tcagcctccc aaagtattgg 147000
gattatagga gtgagccact actcctggcc tattttctta ttcaactgtct aaatttatct 147060
tgttcattta ttacataact tgtttatago ttatttctca gotggacatg gtgootoaca 147120
cctgtaactt caatactttg ggaggctggg ttggagaatt ggttgagccc aggaattcaa 147180
gaacgcctg ggcaacaaag tgagacctg tctataaaaa attgtttaaa aattagctgg 147240
gcactgtggc acatgcctgt ggtccagct acttgggagg cagaggtggg agaactgctt 147300
gggccacgga ggttgaggcg acggtgagcc atgattgtgc cactgcactc tagcctagt 147360
acagagttag accatgtgtc taaaaagtaa ataaaaatag ttctctcttc atgactagaa 147420
tattacctct atgtgggcag ggaagtgtgc tatactattt ggcactatat tctctgatto 147480
tgaatttatg ctagacacat ggtaaglaet ccttaaatat ttattgactg aattatttaa 147540
tacttaagaa ttctactttg gattatctga gtggtaagat taaggattat atttatgtaa 147600
gaaaaaatca ttttttaaac ttggttgccc tttgccacac tgacatagac actaagtttt 147660
ctlagccaga ttacttccga ggataclcac agaggccatt ctcttctcaa tcccaaat 147720
attgatattt cttagcaact tcaagctaet gcaattctta gatgatgtat ctgtgtatat 147780
catatctctc ttctacaaat gtagaattg aagtcgtggc acagtggctc tcaactgtaa 147840
tctcagcagt ttggggagcc aaggcgagcg gatcactgag gacaagagtt aagaccagcc 147900
tggccaacat ggtaaagcct tgcccttatt aaaaatacaa caattagggc cgggcgttgt 147960

```

-continued

```

ggctcacgcc tataatccca gcaagtggg aggcacagc aggcagatca cgaggtcagg 148020
agttcgagac cactcctggc aacacagtga aaccccatct ctactaaaaa tacaataaat 148080
tagccagagca tgggtggcag cgtctgtagt cccagctatc gggaggtgga ggcaggtgaa 148140
tcctctgaac ccggggggcg gaggttgcaa tgaagtga tggcaccgct gaactccagg 148200
ctggtcaaca gagggagact ctgtctcaaa aaaaaaaaaa aaaaacaatt agccaggcgt 148260
ggtggcgggt acgagtacct gtaatccag ctactaggga ggtcgaggga ggagaatcac 148320
ttaaacccag gagggtggagt ttgcagcggg ctgataatgc accactacat tccagcctgg 148380
gcaacagaggt gagactctgt cttaaaaaaa aaaaaaagaa agaaagaaat tgaggaaatgt 148440
ggagattgtg gtcctgtgatt tgtaggaat cacacagcag gttagtagca actacagggc 148500
tttggttcag aataccacot tgacaaaggt ttgtttacag ttgggtccc ottcctctg 148560
ctttctctcc ttccttattg agggcagctg gaaagaattt tcatcattta ctagcctata 148620
gctttaattt gagttttgaa accctgataa tagagcacag aggaaaagac tgagttttct 148680
ttttttgaga cagtcctgct ctalggccca ggcctggagtg cagtgcacac atctcagctg 148740
gttgcaacct ctgcctccca ggtcaagca attctgcctc agcctctcga gtgctgaga 148800
ttccaggcac gtgtccacc gcccagctaa ttttatgttt ttgtttcgtt ttgttttttt 148860
ctgagatgga gctctctctc gtcacccagg ctggagtgca gtggtgcgat gttggctcac 148920
tcaaacctct gctcctcggg ttcaagcaat tctctgcct cagcctcccc agtagctggg 148980
actacaggla cgtgccacca tccctagilo atttttglat gtttagtaga galggggttt 149040
cactatgctg accagcctgg tctogaactc ctgatctcag gtgatctact cgtctcagtt 149100
tcccaaatgt ctgggattat tggcacacgc ctatttttgt attttttagt gagacggggt 149160
ttaccatgtt tgggttagact ggtctcaaac ttctgacctc aagtgtttg cccgccccag 149220
ctccccaag gtctgggatt acaggcgtga gccaccgtgc ccagccaaga ttgagttttg 149280
aaagagcct tctgagatta tgagaagggc aagcaagata acttaagaag ttacattaaa 149340
atcatctaag agacagtgt acaagaagga attgtaaaa gatgttatga gcaagtgc 149400
aatgtagtgg caatcccttg tgcttcgata cattggtggg agcaaaaact gtacttaaat 149460
tgataaatcc cttaactgtc attttaagga gcttagactg actcccatca tgtagaacat 149520
agagattctc tttttttttt tttttttttt tttttttttt tttgtgacag agttttgctc 149580
ttgttcgga ggcctggagtg caatggcgtg atctcggctc accacaacct ccacctccc 149640
ggttcaagca attctcctgc ctacgcctcc cagtagctg ggattacagc catgcacacc 149700
cacgcctggc taatttttga ttttttagtag agacgggggt tctccatgtt gtggtgggtc 149760
tcgaactcct gacctcaggt galcctcccg cctcagccac ccaaagttct gaaattacag 149820
gcgtgagcca ccgcgccag cccagagatt tctaaacaga gttctaacca gatgcttttc 149880
cctgtcagta gaattgagaat gaattggagg tgggagagac tggcatgagg gacacccagt 149940
agccagtgga attagctggg aatgttgata ggagaagaaa aagattcaaa gttaggtagt 150000
ggtagcaaga attagaggga aggtcggatt tatgatatgt ccaaggttga attctaaggt 150060
gaaatttggt ggcagatttc atgtgtaaat tgggaaggta gatgtagttt ttttaacatg 150120
ggttttctaa catgtcaata gagtgaactc gcaggggggc ctgacgagag aacagtgcat 150180
ggggtgattc aacagccagt tgagccttca tgcagagcat ttaacactgt gactctgtag 150240

```

-continued

actotggttg gacgtaaaaa ttcatataac caatatattaa accotttaggt aataataaaa 150300
 aligaggggaa aaggatccag gttlllglatl tlllatlgaat tcagttatlg aatlaaacag 150360
 gacottgcoct caagaaataa totaccaaca attaacttgt tttaaagcaa agttaggaa 150420
 tgagcatgtt caaattatta aataaaaaag taagctgtgt atttcattca tagaaataga 150480
 ggotggccta cttcggatga ttctcagcat gtgattacag atgtgggcll atacatccta 150540
 gggagttaa gctgactctg gcttgatag agtagagctc ttgaaactc ttctctcacc 150600
 cagctagttt atatagacta gagaactaga atgtagcagc atactctgtc ttagaagccc 150660
 ttttatatag gagctggtct ggaagggttg aaaaacataac aaatgtgttg gtgtctccca 150720
 atgtattgct agtattctac ccaagagcat tatcctgggt aggggtttgt ttgggtttgt 150780
 lltgtttttt aatgtllgoc acaaaactaac actagatgtl agttctttca tcaagtggg 150840
 agagtgaag aaaagtcag aactctgaaa cactctttca aaagttttc aagccatgat 150900
 gtttgcaagt taaatgctct gttatgtaag caatataatc agtttttatt aatgtaacct 150960
 lctttagtgt tttgggtgat cacacaaaaa agaalatcca tatctggaag caacagctll 151020
 taataaagag cattgtggtg gtggtggtga tagtggtttt ttttttttt tttgagttgg 151080
 agtctcgctc tgttgccag gttggagtc agtggcagca tctcagctcg cttaaacctc 151140
 tgctcccagg ttcaagcaat tctctgcct cagcctcctg agtagctggg attataggca 151200
 cctgctacca tgctggctg atttttatta ttttagtaga gacaggtttc accatgttgg 151260
 ccaggctggc cttagaactct taacclcagg tgaalcaccc acclcggccl cccaaagtc 151320
 tggaattaca ggcataaac accatggcca gccaaataag agcattttta atgtaaaatt 151380
 atgcatgaaa tgtacattca attttgtctt tgttactag gatccatgtt ctcccaagct 151440
 atgaagaat ggggtgcaag aaatactgat gaggtaaatc ctacccttag gataaaaaa 151500
 tttctgttta taagtgcac cctcatgtaa gtgaggttta aaattttct tttctttagg 151560
 tcccatgttt aagcagcatg gcacatttat gttctcttac ccagaatgta ccaagaaggg 151620
 tgggtccctt cttaacatct aacaattgco tggtagtagc agtgaaggta tcttcagta 151680
 gaggctaggc ccatcgaaag atatactgc attcaagttt ccatcgcca gacggcatca 151740
 gtaactagtg tgtatgaca aagctcaant gtttaocttc ccaactggcag ttttaoctta 151800
 agtagtgag gcttgccttt ttaaatgta attaagtaca ttgagagatg ggaggtgaaa 151860
 aaaggaat tttttatttt gaccatctaa tatgaagta gttcgggtgt aggtatccag 151920
 tagttgacac tggaaagacag ggaatgacat gttaatatc atagccagag ggtggcccag 151980
 gtttttctgt acatgggaat gaattcttta tccaaataag tagaatttat gtgcgtaaag 152040
 catttgttaa gagcactgag tatglgcato tcatccato taagaataa ccattatcac 152100
 cagtttaaat tattttcttt aggccagga agagctagct tggaaagatt ctaaaatgat 152160
 agtcagtgac attatgcagc aggcctcagta tgatcaaccg tttagaanaa ctacaagggt 152220
 aaggatgact cgtllllgtg taaacaaaa aglatlaltl tccaggglga aaaaataaaa 152280
 agaacataag ggggtttctt gcccttgaa gattaactgc tgtggggatt accctcttat 152340
 cataagcaac tagaaaattg acaaaactaa tgaacaaat gtttgcatat attgggaant 152400
 gggcaataca gggaaacat ggaacccaaa cagaagccag tagtcttgct gaacgaaga 152460
 gttaaatata aaagtccaag ccaggtgcag tggctcagc ctgtaatccc agcaatttgg 152520

-continued

gaggccaagg cgggtgaatc acttgaggto aggaagtcaa gaccagcctg gccaacatgg 152580
 tgaaacccctg tcttagccgg gtgtgtgtggc aggcacctgt aatcccaact atttgggagg 152640
 ctgaggcagg agaatcgctt gaaccaggga ggcggagggt gcaagtggcc gagatcacac 152700
 cactgcactc cagcctgggc gacgagcgaa accccatttc aaaaaaaaaa tcaagttca 152760
 gagagctcaa tttgagtaga agttgttaga taaggtagca gaaaagagga agctgcccag 152820
 aaagaaagcc gttagagatat ttagagagat tcccatggat ccttggccta ggagtgatct 152880
 gtatatgtgt ggggtgaaa cgcctgtgtc caggtagaga acccccagga aattagtagg 152940
 ctgaatgatt gctggaacat agggctaaga aaagtctatg gccagaagga tctggccaga 153000
 gttagagagac tttagaatac acaaggcatt gggtagtgtc ttcacagagg ttatgcctta 153060
 ctactgaaga taaattagtc cttagagtaca agcaacctgaa ccaagtttca aagcaaat 153120
 ttaagggttc aaattaccta acaactgcct gccaaaacaa aggcctaacc ctctttacag 153180
 taacacacaa aaatttagca cttoacagtg taaggttaga atgtctgagc tccaggtctg 153240
 gcgcagtggt toatggcctg aatccagca ctttgggagg ccgaggcagg tagatgacct 153300
 gaggtcagga gtccaagacc agcctggcta acatggtgca acccctctc tattaaaaat 153360
 acaaaaaact agccaggcat ggtggccggc acctgtgata ccggctactt gggaggctga 153420
 ggaggaggaa ttgctgaac ccaggagggt aaggttgtag tgagccgaga tcgcaccact 153480
 gcactctggt ctggggcaaaa agagcaaaac tcagggtcaa aaaaaaaaaa gaattgtctga 153540
 cgtcaatcac aaattaccaa gcatgacatg aagttgacct ataaccagga gaaactcaa 153600
 tctatagaaa cagaccagga tgtgagaag atgatgaatt tagcagacaa agaccatcaa 153660
 gtggtctatt taanattaa aaatatgttc aagtggccag gtgcagtggc tcatgacctg 153720
 aatccacgca ctttgggagg ccaaggtggg taggagttca agaccagctt ggccaatatg 153780
 gtgaancccc ttctctacta aaatatcaaa aaatttagct gggcatgggt gcagggtgct 153840
 atagtccag ctatatggga ggcagaggca caagaatcac ttgaaccagg gaggtggagg 153900
 ttgaggttgc agtaagccga gatttgtcca cttgtactcc agcctggaca acagagttag 153960
 acctgtctc aaaaaaaaaa aaaaaaagtt taaggaaaac aagagtataa tgagaaaaat 154020
 gcaaatagtt tttaaaagaa ccaaatggaa ttctttaaaa taanaaatca cagaaatggg 154080
 ggcgggcgtt ggtagctcac gcttataatc ccagcacttt gtgggggctg aggcaggcag 154140
 atcacctgag atcgggtagt caaggccagc ctgacccaac tggagaaaac tcatctctac 154200
 taanaataca aaattagctg ggcgtggtgg cgcattgcct gtaatcccag ctacttggga 154260
 ggcagaggca ggagaattgc ttgaaccagg gaggcagagg ttgcggtgag ctgagattgc 154320
 accagtgac tocagcttgg gccacaagag tgaactccg tctcaaaaaa aaacaaaaa 154380
 aaacagtag actcgaaaga ctagctgagt tttctttac tttaggcagt aagttgtagc 154440
 ttttgaggtt gactacttta gttcctaatg tctcatttag tagatcagag aaattcgaca 154500
 ccaaaccccc aaagaaaaa ccccllclaa tctcatlcc atgatlllal gaatgcalga 154560
 agtccatgga ctgcgaagga atactcatc tctttatcct gtgttgatac ctctctgctt 154620
 caacctcaaa ctgcgaatct gctatagga tgtacttggc cacttagcat aaactaccta 154680
 acacatttac tgaattgctt catgtgcaca tgtccatgc cacaataccg gggaccttgt 154740
 cttccgtgat atttgtccgc agtgctgtga ctacaggagg gagttagtga atgtctgcat 154800

-continued

gtgtgtcttt	accatccctc	ttgaatatgc	tctagggtta	attcctagaa	gtagaattac	154860
ctlatlgaaa	atlggcaata	tttttcatlc	taataictat	tgcacaatg	ggaagcaag	154920
tctggatgcc	agtccctggt	atatgcccct	tgggtaagtt	acgtaacctc	tttaagcttc	154980
tgttcactca	tattttaana	aggnaaatta	caatatttta	cctcacaaaa	ttgtagtca	155040
ctctggctg	tcttaaacic	tggatatag	taaacactaa	gtgttgggtg	ccatccctaa	155100
tttgtataa	taggtcactt	gttagagaaa	tgcaccttac	catcttcttt	tctttctttt	155160
tttcagttat	gactcaaaac	ttgagatana	ggaaatctgc	ttgtgaaaaa	taagagaaat	155220
tttttccctt	ggttggatct	ttcaacacag	ccaatgaaaa	cagcactata	ttctgtatct	155280
gtcaactgtt	ttccagagag	agaatgggag	acaatccctag	acttccacca	taattgcagt	155340
aactgttagg	ataattgag	cacatgatgt	tcacacagtg	agagtcttaa	agatacaaaa	155400
tgttatgttt	tacattacta	gaaaattatt	agttttccaa	tggcaataac	ccatttatga	155460
gagtgtttta	gcttacttga	atagacaggg	acacatctct	ctgggaagga	gataagcata	155520
gaactgatal	ttgaltgcac	ctcgtatggg	taactcatcc	ctaactagca	ttgtaaagca	155580
ggtgccaagag	gtggtttgct	ttgtccttcc	aaagcagggtg	agtccagccc	accagagccc	155640
aggcagcttt	gagtggcagc	gtgggtgctag	cagcttcagc	ggacacaggt	gagagttaat	155700
tatgcagtct	tcttgacagc	ggcattaatt	tggaaagaaa	ctgacaagtc	atgggtcaag	155760
tttcagtgc	ttctcctctc	ctctgatggc	agtatatagt	tttcacattt	taattctctc	155820
tcctgagag	cactataact	aaaaccatlc	tctccctctg	taacagaagg	gtgtgaaatc	155880
ggtttactct	gagcattagg	atttgccctc	ttggaattct	gcactccagt	tacttaactt	155940
tcctctcaga	atcactgtgg	aaagaaagaa	agaatagcgt	atgactccac	ttttgcccct	156000
gtggcacctt	gaacaaagca	gttcttccca	aattataact	tttttttttt	taataaaggt	156060
gagcaggatg	actggggaga	gagaaacatt	tgactttgac	tgcctccccc	attctttgtc	156120
gtgagctgga	aagtgtgcag	ttggttgtct	ttcttctcct	ttcttttaga	tagtaagaga	156180
ctcaactcact	gcactctctc	tcagtctggc	tctgcactcg	gatcacacag	ccatcagcag	156240
gactgcccag	ttggtgagca	cactccattg	acccagctgg	gccagcgctt	cctcaatgca	156300
catgattgag	aggaaagaaa	gttctctttg	atgttactgc	ttttgtctag	actttgaaa	156360
aaaaaaaata	tatatatata	tgtataaata	tataattatt	aatacctttt	gtccttgaga	156420
aagtcttgaa	tgaacagaga	atttattcca	ttgcaatatt	tgattgtata	gaggcacact	156480
gtttcatcga	cagaagaagc	aaaaaggctt	tgtgtaagtt	tttggtacta	tgtaccacct	156540
ctgttattct	tttaaaagctg	aagtattcat	gtacttaaac	catattatat	ttatttgtgt	156600
ttgattttaa	aatalatata	tatgaattct	atttaaaatt	gtgtcaactt	cttgcctttc	156660
gggcattttat	ggctctctctg	ttgaaatata	ttgatctttc	caaatatttt	catttgcttt	156720
ctaaaaaccc	agaaacatgag	ccactactgg	actttgcctt	gtgtttgaag	tgtattggcat	156780
aaacccaagg	tttttattag	tcactctatgc	tgtgattaat	tcatttttgt	cttttaacaa	156840
aatattttcca	tcactctcac	attgcttcaa	tctttaacag	aaaagcaata	taaagggttat	156900
agaataaaat	tgtgtttttg	gaaactcttg	ctgactctgc	atgttttgga	ataaacaatt	156960
ctacaagact	ctaggctgtt	taaacatagc	cttctagtta	agataaaatc	taactatttc	157020
tttgtatata	cattttgtgc	ttctgagcta	gagatgcaa	gtagttgtaa	actgcttata	157080

-continued

aagagaatag cagcaaatatt gagactoggc tacttttttc tgccccacct gctttgagac 157140
acagaagcgg agtgtggccc gaattattta gccagattta aatttgatc laaagtaggt 157200
ccttgtactc attttaaagt tggaaattga ttcttccaac attgagcacc caccatgttc 157260
caggctctgt gccattgtgc cacaaaaata gattccctgg tggagttttt atgggttcac 157320
aataacagtt gaacacccit catcttiatc atgttgttga cattgacaca aattgtttta 157380
aaagaaaaga tattagagag aaagtggtag ctttgtaact tgatgtgtct tcatcattcg 157440
gtagatattg atgaagaata aaagcaaatg tcagccaaat ccagtgaaca gcaataaaca 157500
agggagtaac tttttataac tttttctact tggattttcaa cattcagtag agcttttcga 157560
aatgtaagta gtttacagta ctggagggtt gactagttca gtaggaaatt ggaggggaag 157620
gtcattctga attgtaacaa agtacaacct tctttgctgt ttattttaag tactgagagc 157680
taagcacctg atgaagtgc tgacctctct ccagtgcacg tgtttgggta cctgcctgac 157740
ttcaggagtg gggtttatgt ttctacacag tgaccttttc tctgcacctc tcttccctct 157800
tgccacacac ccaglttgatt ggaacctgggt tgaactcctg atccagacag gcccaagaca 157860
gttcttaatg tttagaatatt tggggccggg cccggtggct catgcctgta attgcaacac 157920
tttggggagg ccagacaggc ggatcaattg aggtccgggg ttccaggcca gcctggccaa 157980
catggtgaaa cctgtctctt actaaaaata caaaaattag ctgggcatgg tggcgccagc 158040
ctgtaatccc agctacgtgg gtggctgaga caggggaatc gcttgaacct ggagccggag 158100
gttgtgcaat gagccgagac cgtgtacatg cattccagcc tgggtgacag agggagactc 158160
tgtctocaaa aataaaaata agaaaaagaa ttttgggcta ggtgcagtggt tccacgctgt 158220
taattacagc attttggaag gcccaagatg ggcagatcac ttgaggacag gagttcgaga 158280
ccagcctgga caactggtg aaactccatc tctactaaaa agacaaaagt tagccagatg 158340
tggtgatggg caccataaat cctagctcct cgggaggctg gggcaggaga atcacttgaa 158400
ccagggaagc agagattgna gtgagccaag atccatcttc tgcaactcag cctggggcac 158460
agagcaagac tctgtctcaa aaaaaaaga atttggccag gcgcagtygt tccagcctgt 158520
aatcccgaca ctttggggag ccaaggccag ccagtcacga ggtcaggaga tccagattgt 158580
cctggctaac atggtgaaac cctgtctcta ctaaaaatcc aaaaacttag ccgggtgttg 158640
tggtgggcac ctgtagtccc agctactagg gaggttgagg caggaggaag atgtgaaccc 158700
aggagccgga gcttgacgta agccaagatc gtgccactgc actacagctc gggcgacaga 158760
gtgagactcc gtctcaaaaa aaaaaagaat tttggccggg tgcggtggca catgcctgta 158820
gtcccagcac tttgggagac caaagtgggc ggattacctg aggtcaggag ttcaagacca 158880
gtccggocaa tatggcgaaa cctgtctct tactaaaaaa aatacaaaaa ttagccaggt 158940
gtggtggcgg gcaactgggg aggtcaggc agggagaaat gcttgaaccg gggaggcaga 159000
ggttgagata agcccaagatc gtgccactgc actccagagc aagactctt ctcaaaaaa 159060
aaaaaaaaag aatttgcac ggggaaggag agatacgttt caccatctgg aatggtgcll 159120
ggatgtggca cttacaaaat caggagccag cactgcattg acaaacagaa gcattgtggc 159180
ctgagatagc aggtacactg ataacactga agacatcctt ggtttctgca tctattctgt 159240
catccttgca ttggaactaca ttaactctgc agttatcctt ataagtattt ttgatttttt 159300
ttttttgaga tggagtctcg ctcttgctgc ccaggctgga gtgcaatggc acgatctcgg 159360

-continued

ctcaccacaa cctccacctc ccaggttcaa gtgattctgc tgctcagcc tcttgagtaa 159420
ctgggattac agggcatgcgc caccacacct ggctaalltt glattlittag lagagacggg 159480
gtttctccat gttgggtcagg ctgggtctcga actcccaacc ctagggtgac accctgtctc 159540
ggcctcccaa agtgctggga ttacaggcgt aagccatggt acccggtctg ttttttgatt 159600
ttltgaaacc agtctgaagt gagttttttt aattacgtga aaggagtitt gctaaaatac 159660
tgccatactg cctcaatgac taatgattat gtattctcag catgtctgca aagtactgct 159720
gatttttgga gaataatttt tctttagtaa acttcaacta agtcgtcatg tgtattctct 159780
caaaatggta tctcaaccta atggagctaa aagacacccc ttgtttttat aacaagcagt 159840
tactgagccc caggaaaggg agaagtcctt ggccttgtag atgatcacca ttagaactca 159900
ggcctgggac agtgcccttt catgcttctc agatccttcc aaagaataat gaagattata 159960
accgctttta gcaattgtaa taaccccaga aatagaaaagc tttttgggta gagtactggt 160020
agaagtgttg cgggagagat aatttttaca aaatttgtaa atacctgcaa attctatata 160080
ctaggcaagg tctctggcct tgtaaaaccc ctcaagggtt caactttggt ggcacacact 160140
aatagttacc cactgaaggc ctctcgggtt gaacattgag cactagaggga agccctctct 160200
cttgggcagg actggcgtg gtgcagagta ggagcgggtg tactgtggat tctgggcagg 160260
tgagatggc cagtgtgtc caataaagga cactggaggg agcagtgtga gtaaaagccc 160320
tgagggcatt catgttcagg gaggttgct gccactggc ttgcttgga cacaggagag 160380
tggttatcc tgcttagta actttatgta aacaagtatt tctcagttc gttctctca 160440
aactgctgc tctggcacat tcagaatgac acagaactca cctggatgca ttcagccctc 160500
tgctaaag tgacagtga tctcctccc caccacccc ctcataccac tgaagcactt 160560
gtcagactgg cccagtctgt gggcaaggag cctagagagg gcttagtttc agcttgaaag 160620
gagctgggat ttaccaagaa gcaaatgaga gacgaggatt gcaacaactg tgccatttcc 160680
ccagcttcag ctgactctg tatattgact gtgccttcag actcatcgt aagtgaaccc 160740
aggctggcct ctcccacac acagtaagaa ttccacacac catacaactt ggaagagggc 160800
tcagctgaa ggaagcccca caattcttct aagttttctc tagctctctc ttcttgcaa 160860
agagtacatt ttgtttcttc taattatgta actattgggt tagtaaatat tcacccattc 160920
agtcacccctg taagtggcag gcactgttta cagggaacaca ggaaggtaata aaaaactgca 160980
ggcacccttg agcttgcat ctattgaaga ggtaatggaa gttgggtag cagctaaact 161040
atgctgggat tggccaggcg cagtggctca cactgtaat ccacgacctt tggaggccaa 161100
ggtgggcaga tcatgaagtc aggagatcga gaccatcctg gctaacatgy tgaaccccg 161160
tctctactaa aagtaaaaaa aaaaattagc cagggtgtgtt gggggcgcc tglagtccca 161220
gtcacttggt aggtcagggc aggaagaatgg tgtgaaccca ggaggcgaaag attgcagtga 161280
gcagagctgg caccactgca ctccagcctg ggtgacagag cgagactctg tctcagaaa 161340
aaaaaatatg clggtagllt lgattcaaga tggcctllgg agcccatgat ttaggctctg 161400
taccacccaa ggtctactgg aaacatcag gctctcctg tatagacca tagggagagc 161460
tgagagcag agggggagct gaagagaagt gcccttctg tgtctgtca gctcactct 161520
tcgcgaagga ccagtgtctg tgccactcca ttcactgtct gcaagactgg aggtttttcc 161580
tcagggtgtg agcaccctgt ttacaagatg tcagcactct gatgctgag accatcaagg 161640

-continued

```

caagttctctg aacaggggctt accttagagt aaggccttaga agaggccgta aagtcagttc 161700
cagctccgltg gctctgcaga gctttgggac atgtgaattc ttaaaaacaa gactatttga 161760
cagttactat atgcacgcag tataaaatta taaccttgga aaatcctagc tagctgttga 161820
gctaattcca taaggtaatc agctcctgag ttctgcagtg gtaantaata tcagcataat 161880
gagtaaacac tgttgtgtgc aggcagcgctc tcatttgatc ctgtgtataa tcttgtaagt 161940
actgattttc tcccttcttt aaacaaagt tttttttttt ttttagagag ggtctcacta 162000
tgttgcgcag gtagtgttg aatto                                     162025

```

```

<210> SEQ ID NO 36
<211> LENGTH: 162025
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<220> FEATURE:
<221> NAME/KEY: mutation
<222> LOCATION: 156,277
<223> OTHER INFORMATION: Nucleotide Base Change: T to C

```

```

<400> SEQUENCE: 36
gaattcctat ttcaaaagaa acaaatgggc caagtatggt ggctcatacc tgtaatccca 60
gcaccttggg aggcagaggt gngtgggtca cttgaggta ggagttccag gccagttctg 120
ccacatggt gaacacactgt ctctactaaa aatacaaaaa ttagccgggc gtggtggcgg 180
gcacctgtaa tccacagctac tcaggaggct gaggcaggag aattgcttga acctgggaga 240
tggaggtlto agtgagccga galogccca clgctctcca gcttggglgg cagaglgaga 300
ctctgtctca aaagaaaaaa aagaataaaa tgaacaatt ttgttcacat atatttca 360
aatttgaaat gtaaaagta ttatggtcac tgatatcctg ttctattctt tatataatca 420
ttaagtttga aatgtatact tgcactacta acacagtagt taatcttagt cctacaagtt 480
actgctttta cacaatatat ttctgtaata tgtatgcact ggtgtttatg tactgtttta 540
tgtttatata tgttaaaatt agcagtttcc atctttttct attttgtacc atcacatcag 600
ttcagaagga ttgacagagc aaaatgatt gatgaagtat aaaagtcaca tggtgagttg 660
cataaataca actctgaaca attaggaggc tcactattga ctggaactaa actgcaagcc 720
agaagagcac atctctctata tgtcaagaga tglacacccc aggcagttaa agaagggaag 780
tacacataga aagcaccaatg gtgaataatt aaaaatttgg aatttatcag acactggatt 840
catttgcctc taaggtcaga gtccctctatt gtttttttgt ttttgggtt ttctttttta 900
atttttttat tttttgtaga gtccgagtt cactgtgtta ccgggctgg tctagaactc 960
ctggcctcaa acaaacctcc tgccctcagc tcccaaagca ttgggattac agacatgagc 1020
cactgagccc agcccagaag cttlagcatt tatgaagctt ctgaaatagt tglagaaacc 1080
gcataagctt tccatgtcac ttccaaagtt tgatggtctc tttagtaaac caaccagtt 1140
attcctcaag ggcataaata catttctcag tgcataactg atgcacttca ttaccaaaag 1200
gaaagagcca caactalaga ggcgtcaltg aaagctgcac tcttcagagg ccaaaaaaaa 1260
aggtacaaac acatactaatt ggaacattct ttagaagagc ccaaaagtta atgataaaca 1320
ttttcatcaa agnagaagga gaaacaaggt ttagaaatt cctctatcaa ataaactaa 1380
acatcaagga acatcaatgg catgccatgt ggaagaggaa gtgctagctc atgtacaaac 1440
cagtagataa tttcaacttg ctgccgaatg aaacctctt gcaaggtatg aatcagcact 1500

```

-continued

totoatgttt	gttttgcctt	gttttgtttt	gttttttagag	acaggccctt	gctctgtcac	1560
acaggctgga	gigcaglggc	acgatcagag	ctcacigcaa	cttgaacctc	ctgggclcaa	1620
gggatctccc	tgccctagcc	tcccaagtag	ctggggactac	agggcccacca	tgcccagcta	1680
atttttttaa	ttttctatag	agatgggato	tcactagcac	ctttcatggt	tgatgttcct	1740
atacaacgac	caagggtacaa	tgtggaaaag	ggctctcagg	atctaaagtg	aaggaggacc	1800
agaaagaaaa	gggggttgcta	catagagtag	aagaagtgtc	acttcatgcc	agttctacac	1860
actgtctgtt	tctctcagagc	agagttgatg	atctaaatca	ggggtcccca	acccccagtt	1920
catagcctgt	taggaaccgg	gccaccacgc	aggaggtgag	caataggcaa	gcgagcatta	1980
ccacctgggc	ttcacctccc	gtcacatcag	tgatgtcatt	agattctcat	aggaccatga	2040
acccatttgt	gaacttagoa	tgcaggggat	gtaggttttc	cgctctttat	gagactctaa	2100
tgccgggaaga	tctgtcactg	tcttccatca	cctcgagatg	ggaacatcta	gttgaggaa	2160
aaacacctca	gggtctccat	tgattctata	ttacagttag	ttgtatcatt	atttcattct	2220
atattacaat	glaataataa	tagaaalaaa	ggcacaatag	gccaggcgtg	gtggctcaca	2280
cctgtaatcc	cagcacttcg	ggaggccmag	gcaggcggtat	cacgaggtca	ggagatcgag	2340
accatctcgg	ctaaaaacgt	gaaacccctg	ctactaaaaa	ttcaaaaaaa	aattagccgg	2400
gtgtgtgtgt	gggcacctgt	agtcccagct	actcgagagg	ctgaggcagg	agaatgttgt	2460
gaacctggga	ggcagagctt	gaggtaagcc	gagatcacgc	cactgcactc	cagcctgggc	2520
gacagagcga	tactctgtct	caaaaaaaaa	aaaaaaaaaa	aagaaataa	agtgaacaa	2580
aaatgtaatg	tggtctgaatc	attccaaaac	aatcccccca	ccccagttca	cggaanaatt	2640
ctccacaaaa	accagtcctc	ggtgccaaaa	aggttgggga	ccgtcaatct	aaataatcta	2700
atcttcttct	aatgtcaaaa	aatgaataaa	ctttttttta	aatacacggt	ctcactttgt	2760
tgcccaggct	ggagtacggt	ggcatgatca	cagctcactg	tagcctcaat	caccacggcc	2820
ccagcgatcc	tccacacctaa	acttctctgag	tagctgggac	tacaggccag	caccacccatg	2880
cccagctaatt	ttttaaaattt	tttatagaga	tgggggtctc	accatgtttg	ccagactggt	2940
ctcaaacctc	gggtctcaagt	gatctctccc	caaacctcctg	gaactcaagt	atcctccttc	3000
cttggcctcc	caaatgtctg	ggattacaag	catgagccac	tgtaccacga	tggtataaaa	3060
ttttaagtct	cactacagtc	atggacaatc	aggtcttttca	acatgcagta	tggaacagtga	3120
gtcccagggt	ctgcttttcc	atactgaatt	acatgtgata	ctaaggagaa	aggtgtctcg	3180
aagatatttt	aaaatgaaga	atatttaaaa	tgaggaaaaa	actgtttctt	catgactttg	3240
ataaggctga	taaagaccat	ttctgtgato	tcagggtgatt	cactcaagta	gtatatttca	3300
glaatcatta	tctggaacag	cctgaatctt	aacaaaata	ccaigatttt	ttaatgtctg	3360
tatgatacct	tgtatgatag	accaaactgc	aatgtaggca	gctaatactc	cacgagtttg	3420
acttccccga	gagttgacag	ttttcttcac	aaattaaaaga	aattatatttt	ttgatacatg	3480
atlggcata	tlaaaaacia	cactgaaatg	ctgcaaaatg	atataaagaa	acattttcca	3540
gaatcaaatg	caatcaaaqa	gtggattagg	aactactcta	ccattatcaa	ctaaatagaa	3600
acacttggac	tggtgtgtgt	ggctcacatc	tgtaatctca	gcactttggg	aggccaaggc	3660
aggtggattg	cttgaggcca	ggagctcaag	acacgcttga	gcaacatagc	aaaactctgt	3720
ctctacaaaa	aaaaaaaaaa	attaaccagg	catggtggca	gatgcttgta	atccagcta	3780

-continued

<hr/>	
ctctggaagc tgaagtagga ggaactgcttg agccoaggag atcaagactg cagtgaagcg	3840
tggtcatgcl gggccacagc ctgagtgaca gagagagacc ctgtctcaa aacaaaaaca	3900
aacaaaaaac acctaacctt cctgtttttt gctgtgtgtg ttgttgtttg tttgttttga	3960
gatggagtct cactctgttg cccaggttgg agtggaagtgg cgtgatcttg gtcactgca	4020
agctctgcoct cccgggttca cgcattctc ctgcctcagc ctcccgagta gctgggacta	4080
taggcgcccc ccaccaagcc cggctacttt ttgcatcttt tagtagagat ggggtttcac	4140
ogtgtagtgc aggaatggtct tgatctcttg aactgtgat ccacctgoot cggcctccca	4200
aagtgtctggg attacaggca tgagccaccg caccgggcca accttctgt tttttagttt	4260
gatatgcttg ttaactcagc agctgaaaga atgctgaaag tggccttcag taaaaaatt	4320
tcactagaat ctctacatcc atatttaato tgaatgcata tccagattga tcagttagag	4380
caaaaacact catcatcatt cctgatgacc tctaattctg gtttcggctt tctatttcaa	4440
tggaaacaga ataaggaaag aaatggaagg gctctggaaa ttgtctcttg gctatagata	4500
ctatcaaaaga tcaaccaaca taagatctct cclalaaata taaaacaagt alaattaat	4560
ttttaattat tttttctct tcagaggatt ttatttcaag ataaaacata actctaccc	4620
atactattga ttccaaaggt tggaaaagt gtttttctc atcttctct tcaangaggt	4680
cacagcaatg caaacatcta taaaatgcct ctgcataatt gtcagaagct atagtccaga	4740
aatcattgaa aatgcttttc cattttaagc ttagggtagg tgtcttagga aacctctatg	4800
acaacttact ctatttatig ggaggtaaac tccagactc tccagggtc tctgtattg	4860
atctcatctt ttaggcttcc taatcccttg aagcacaatc gaaaaagccc tggatctctt	4920
ttctgcacat atcatcgcg aattcattcg gctccagca agctgacact ccatgataca	4980
agcggcctcg ccttctcog gacgccagtc ctgtctcgg ttacttagga tgaggggtt	5040
gctgggcttc agtgcaagct tctgcgggtt cccaagccgc accaggtggc ctacacggct	5100
ggatgtcacc attgcacact gagctccttg caggctgtac caatttttta attatttaac	5160
atttattttt aaaattatg tgaatattt ggtattctgc tctaaaatag gccataaat	5220
gccagcaga tatctcttg aacccacagc ttccacttg aagaactaag tattttctt	5280
tlcaagatgc tactaagtct ctgaaaagtc cagctcctct acctcttcc atcccaaat	5340
aagacttgga atttatgaga gatctagcta acagaaatcc cagacacatc attgttctt	5400
ccagagtgc agtctctcta aagaggctca gccctaagca ggcccttgca ccaggaggtt	5460
gggtctgaga cccacatagc acttcccaag gtgcatgctc cagagaggca ctgaacagc	5520
tgagcacaag cctgcaagcc tggagaactc tcacagtcag aacggagggg gccagtgagg	5580
actaacalaa agagaaaagg gaacacagag aaatggatgg caaccaaac cagcaagcc	5640
ttcatggcca atgaaaagcat cagtgaaggg gccagaaccc tcatacccaa agactcttca	5700
ctgcctttag tgaaaaacaa tggctagaga gtgaagtat gatcatgtat agagaggtaa	5760
agllacattt tlattcttg actctgtcaa tglgaaatto cclatctgt agactaaaag	5820
tttcagacac cctgttcaaa tatcccatca gttgctagag acttaaaatg aacagaacgc	5880
acattgtcag gatgaatatt acaaaaaat caaagacag caagtatttg tgaggatgta	5940
gagaactcgg aactttttg cactgtttat gagaatgtaa aatggagcag ctgctgtgga	6000
aaagagtatg caggttcctc aaagagttaa accaagatgt ggaacaact aatgcccac	6060

-continued

cagtgagatga aggggtagac aatatgtggt atatacatac catggagtac tattcagcct	6120
ctaaaaaaa aaaaaggaaat tctataacat gcaacagcat ggatgaatct lgaggacatt	6180
ttgctaataga aataaggcag tcatagaaag acaataactg cacgaactca cttatatgag	6240
atacaaaaa tagacaaatt catagaatca aagagtacaa tggagggtac ctggagctgc	6300
agggcgggaa acgaggagtt actaatcaac gaacataacg ttgcagttaa gtaagatgaa	6360
taagctctca agatcagctg tacaacactg tacctagagt caacaataat gtattgtaca	6420
cttaaaaatt tgttaagggt agattaacaa atgtagtaga tccacaatg tggttaagtg	6480
ttcttaccac agtaaaataa aaaaagaata tcacagccag gagttcgaga ctgacctggg	6540
taactgtgtg aaacctgtc tctacagaaa atacaaaaat tagccagctg tggagggtga	6600
ctctaggga ggctgagggt ggaggcttgc ttgagcccag gaggtaaagg ctgcagttag	6660
ccatgtattgc accactgtac tccagcccag atgacagagc aagacaccac ccccccaaa	6720
aaagaaaaa gaatatcaaa cattttaaaa gatcagatac gcaagaacaa caacaaaaa	6780
gagatgaaca gagcatcgac cctcatctag tgggattctt ggtctaactg aaaaacagac	6840
attgagagac aaacaaatgac agtgatgtga tcacagcaat tacacaggta tccctgggg	6900
actgcagaa gaaaggagaa tgcctaactt tcagaaaaa gagaagcgt caaacagttg	6960
gtgaaagcct tccaaaacta gagagaactg cacacacca atcacagaaa gaagaaaagc	7020
cgtgggagat tctgggaccc accggctatt tttgatggct gaacacctg ctgcaggaga	7080
gacaggagct ggaagcatg gtgggatgaa acctcaaaac gctttgctg cattgtctaa	7140
gatgaactgg cttgattaac tctagtcaat ggggacaatt caatcaaga agaagatgc	7200
tcaantcac attttagaat gattttttat ggcagtatg ggaatagatt aaaaagagat	7260
gaagctggag gcaagaaact tgttaagagg caactgaac agtctagatg ataaataata	7320
aactgcaga gtgactagaa aaatcagaac aggctgaatc aacagatacc tagatgaaaa	7380
taacaggact tgatcaccag ttgtatcttg gagaggaaag agttgtttcc ttgctttccc	7440
tacgactggg aatacggag gtttgccgtg tgtattgggt atatactggt ggttagocaa	7500
tcaatgacaa ccattagaca gcttaaaaca caaaggctta tctccagtt tctgtgggcc	7560
aggaactcaa gataggctta gctggctgggt tctggctcag agtttctcaa gaggttgcaa	7620
tcaagatgtc agctgggggt gcatcatctg aaggtcaac tggggccgga gggctccatt	7680
ccaaggagtt actcaccctg cctgacaaag cagtgtgtgt tgttggcagg agatctcaat	7740
tcattgocaa gtgagcctct ctatagcatt gctggaacat cctcccccac tggcagtttg	7800
cttctctcag catgagtgat ctgagagaga gagcaaggag gaagccacag tgttctctct	7860
actctactc ctacacctat ggaacctact ctacacctct caattctgac ttattccatt	7920
agttagaanaa ggaactaagc tccacctctt gaataaagaa gtgtcaaga atttgtggat	7980
atattttaaa atcatcacac tgtggaagtg gatgggggt tcaattaatg ctgaacttga	8040
aatgcctgag acattcaaat gtccaacagg caatgaacat acccalagat ggtcatgact	8100
ttagcaagaa tagaggagaa tcacagaatt aaggaggcaat tgaaggtaa aagaagtga	8160
gtcagattcc cctgaaaag tgagccatga aaggaaactt aactattgag tttagagttca	8220
gagtaggaaa ttctcgttga attctttttt aaagaaagga accatataag catgttttga	8280
ggtagaggga gaataaatca gtacacagg agaggtaaaa aacataaatg ataggggata	8340

-continued

gttgacaaaag	gtcttggcag	aatcccttac	ccattgactt	ggggccaaga	gagggaacct	8400
cttltgtttg	agggataaagg	aaaataagaa	agaatgggtg	ctatttagtg	lggtccclgc	8460
tctagggcac	acgcataggt	aacaaactgt	gtgtgttagg	aatatagatg	tgacctcaca	8520
ttgagattct	aacctcaaat	ccattttgtt	gttaactgtt	ccttccctacc	ttctcttttt	8580
gctacatgca	gactgctgtt	ttgtcttccct	ggcctgttcc	aggtttcagc	attctggcat	8640
atctgctacc	ctgttcccaa	acctctctag	agtcctatgct	ccttcccttg	atagtgtttg	8700
attgggcccac	gtatctaaaga	agtgatgcct	tcagttaggc	ctgagaaacct	cctctatgga	8760
aatctccatc	agtgaacctg	acagacttgg	tatcttggag	atgtcaactgc	tcaccagcctg	8820
tggtctagga	gaatctcagc	ctgggacctct	agtagtatgg	ataaggcggt	aagggtatctt	8880
tgaaccagag	tcgtctatct	tcctcaatgt	gggacagata	aaacagtggg	agtgcctggg	8940
ttctctagct	agaactctgg	tttttggctt	agattctttg	atgtatgacc	tttcagagggt	9000
attaaaaatt	gtctctaatac	aattgtccat	acaaatgtag	ttcctttttt	gttaggacct	9060
caacaaaaca	tgaccaacig	tagatgaaca	ttaaactatg	acaattcatg	gaatgaala	9120
cagtaatacc	tgcgggttccc	ccatttttagc	agtcactatg	gtgacatttg	gcacaaatgg	9180
ctattttaagg	gtgcttttgt	taaaacctac	cactcttacta	ggcacatgat	attgaacctt	9240
atgaanaaat	ggagaaactt	cttaaaaact	tttaatgaat	aaagtgatga	agtgaataa	9300
tttttagctgc	tatttataaa	gtgactatta	caggctcaaac	attcttctag	ggttttttttg	9360
ttgaagttgt	cacattlaat	ccttaataac	ccactatgag	tcagggtatc	ttctctcccc	9420
tttggacagt	tggggaaatg	ggggtcagag	aggttaggta	atttgctcag	ggccacacaa	9480
cctgcatgta	ganaactctga	gatttgtaca	ggaacgtatc	aaactctgaa	gtccatgctt	9540
ctattttccc	atgtgccttt	tctaataaaa	ggttaactaat	gctactggat	gtgcctccca	9600
aaagttagtca	ctttccacccc	accctacttg	attttctcca	taaaactaat	cacatcctga	9660
caacttattt	attgctgata	tcacccacta	gattataaac	tcaataaaaag	caagatcctt	9720
gtctgctgaa	tatcagtacc	taaaaacgtg	tctagccacag	agcaagtaat	taatatttgt	9780
tgaatgaaca	aataaaggaa	aaaaattcaa	aggagaaaaa	agccctaaaa	cagatgttta	9840
cctaaacata	cattttaaaa	gaagccatat	aacaaattca	ggacagaaat	taaatttgat	9900
tttttaaaaga	aataaccacag	tgctagctgg	gcacagtggc	tcacacctgt	aatcctagca	9960
ctctgggagg	ccgaggcagg	cagatcaactt	gaggtcnaag	gttcaagacc	agcctggcca	10020
acatggtgaa	acctgtctct	actaaaaata	cagaaattat	ccaggcatgg	tggcaggtcc	10080
ctgtaacccc	agctactcag	gaggctgagt	caggagaatt	gcttgaaccc	aggaggcaga	10140
gggtgcagtg	ggccaagait	gcaccacigc	actccagcct	gagtaacaaa	gcaagactct	10200
gtctgaaggga	gaaggaaaga	aagaaggaaa	gaaggaaaga	aggaagaaag	gaaggaaggga	10260
aagaaagaaa	gaagaaagga	aagaagaaaa	gaagaaagga	aagaaagaaa	gaagaaagga	10320
aagaaagaaa	aagaaagaaa	gaagaaagga	accaagtgct	tatttggggac	ctactatgct	10380
atgtttttcc	atgcacgcta	ttttcagtaa	agcagtttag	aaacttgcaa	gatcataaca	10440
acaaatatat	gcttctataaa	ctctaaaatt	gtgctttaag	aagttccctct	ttaccagctc	10500
atgtatgcat	tagttttcta	agagttacta	gttaacttttt	ccctggagaa	tatccacagc	10560
cagttttattt	aaccaaagga	ggatgcttac	taaatgaag	ttatcaaatg	tgagcctaag	10620

-continued

ttggggccagt	tcattgttaat	atactccaga	acaaaaacca	tcctactgtc	ctctgacaaat	10680
tttacctgaa	aattcatttt	ccacattacc	aaggagccag	ggtagggagaa	latagaaaaga	10740
ccacccaaga	atccttactt	ctttcagcaa	aatcaattca	aagttaggtaa	ctaaccacat	10800
gocctaacaa	tgaatagcag	attgtgtctc	gaagaatgat	ctacaaacac	ttactgtgaa	10860
ggaaactactg	aaatatccca	ataagacttc	tctccaaaaat	gatitttattg	aatttgcatt	10920
ttaaaaaata	ttttaagcct	aaattttaaa	aggtttgata	ttggtacatg	aatagacaaa	10980
cagacatgga	ctagacccaag	aattagggttc	aaacatatac	aggaatttaa	tatacgataa	11040
atctagtatt	ccaaaaggac	caacaaatgg	tgttcagaca	gcaggatagg	catcaggaaa	11100
aacacagttg	ggcaccctac	cttactccta	acacccaggag	taactgaagg	agcaccaaaat	11160
atttatttat	tttaattata	gttttaagtt	ctaggggtacg	tgtgcacaa	atgcaggttt	11220
attacatagg	tatacatgtg	ccatgttggt	gaggagccac	aaatatttaa	aagaaaaaaa	11280
ttggccaggg	gcggtggctc	acacctgtaa	tcccagcact	ttgggagggc	aaggtgggca	11340
gataccclga	ggtcgggagt	tcgagaccag	cctgagcaac	atggagaaaac	cccatctcta	11400
ctaaaaatac	aaaattagcc	aggcatgggtg	gcacatgcct	gtaattccag	ctacttggga	11460
ggctgaggca	ggngaatagc	tttaattctg	gaggacacgg	ttgcgggtgag	ctgagatatt	11520
gcactccagc	ctggggcaaca	agagcaaaac	ttcaactcaa	aaaaattaat	aaataaataa	11580
aaataaagaa	agaaaagaaa	aaaatgaana	tagtataatt	agcagaaagaa	aacaccgtag	11640
aatccclggga	ctctllaggat	ggggaatgcc	tataatataa	aaacccclgaa	gtlataaaa	11700
agaaaatcac	ctacatacaa	accaaatctt	tctacatgcc	taaaacatag	cacaaacaca	11760
gctaaaataat	catagctgaa	tgaactggga	aaacaaaact	tgaactatat	ccagacagag	11820
tttaattttcc	tacacataaa	gagtacatat	ataaacccaa	caaaaaaac	accactaac	11880
caaaaataaaa	atgtgacagg	taatgaacag	gtagttcaca	gagaatacaa	atggctcttc	11940
ggacataag	atgctcagac	tgacttttac	ttattttattt	tttgagagac	agggtctcac	12000
gatgttgccc	aggttaggct	caaacctctg	ggctcaaatg	atagtaocag	gactacagg	12060
gtgccccacc	gcacctggct	cctcaaccac	ctgtattaac	aggaatgca	aaataaaact	12120
ttcaaatcta	ttttacatat	tagaatggca	aaactttgaa	aaacttcaaa	catcatcatg	12180
ttggtgagaa	tgtgaggaga	ctggcactct	cattttttgc	tgatagcata	tatatactga	12240
ttgctcttat	ggaaagcaat	ctggcagcgt	ctatcaaatg	tacaagtcca	tatatccttt	12300
gacaaagcaa	ttccactcta	ggaatgtggt	ctatatgggt	gtgcttctctg	gggctgggaa	12360
ctgggagcta	agggacaggg	gcagaagata	atcttctttt	ccctccttcc	ccgttaaaaa	12420
tggtgaattt	tataatactg	aatatattat	ttttacaaa	agataatttt	taagcgatat	12480
gtctgggaat	tttttttttt	cttttctgag	acagggtctc	actctgtcat	ccaggctgga	12540
atgcacatgt	atgatctcag	ctgaactgcag	cctcgaccta	ctgggttcaa	gcaatcctcc	12600
caactcagcc	tcclgtag	ctgggaactac	aggcaactgc	catcatgcta	atttttgtat	12660
atacagggtc	tcactatgtt	gccacaggcta	atgtcaaaat	cctaggctca	agcaatccac	12720
ccacctcagg	ctccaaagtg	ctgggattac	aggcgtgagc	cccgcgct	ggccctggga	12780
attcttacaa	aagaaaaaat	atctactctc	ccctctattt	aaagtcaaaa	cagagaagga	12840
aattcaacct	ataatgaag	tagagaaggg	cctcaacct	gagcaacaaa	cacaaaggct	12900

-continued

attttctgaga	caggaaatttg	ctgaacaaaa	tcgaggggaag	atgacaaagaa	tcaagactca	12960
cttctcggccl	ggggcgaglg	gctcacacct	gtaalcccag	cactttggga	ggcggaggcg	13020
gacagatcac	gaggtcagga	gattgagacc	atactggcta	acacagtga	accagtcctc	13080
tactaaaaat	acaaaaaatt	agccggggcgt	ggcggcagggt	gcctgtagtc	ccagctaact	13140
gggaagctga	ggcaggagaa	tggcgtgaac	ccagggaagcg	gagcttgca	tgagccgaga	13200
tcacggcaact	gcactccagc	ctgggtgaca	gagcaagact	ctgtctcaaa	aaaaaaaaa	13260
aagactcaatt	tctctagatc	ttgagccgta	tccaaattta	tctcagotta	gtgagagggt	13320
aaagcaagga	atatcccttc	ctgtgggccc	tgctccttac	tgaagggaagg	taacggatga	13380
gtcaaggaca	ccaattggga	aaagcaactaa	caccattatc	tgatgaacat	tacgtgaaga	13440
agggtaagaa	gtgaagtggg	attgctgaag	aagtoagtga	aagcggacat	tcatttgggg	13500
aaatggaaata	taggaaatcc	ataaaagtga	ttaaaaagat	gttagaggct	gaggcggggg	13560
gaccacaggg	tcaggagatc	gagaccatcc	tggttaacac	ggtgaaaccc	catctctact	13620
aaaaatacaa	aaaattagcc	aggcgtgggt	gcaggccact	glagtcocaa	ctactcggga	13680
gactgaagca	gggaattggc	atgaacctgg	gagacggagc	ttgcagtggg	ccgagatcac	13740
gcactcgac	tccagcctgg	gtgacagagt	gagactccat	ctcaaaaaaa	aaagttagat	13800
acgagagata	aagatccaac	agacacacaa	ctgctaattc	tgaacagaac	aaaacaaatg	13860
gcacaggaaa	agaaaaattta	agatataaca	ccggaaaact	ttcctgaaat	tgagtaactg	13920
aalctatagc	tlgaaagggt	ttagcalatg	ccaagaaaaa	tcagtagagt	ccaaccagca	13980
caagacacat	ctagcaaggc	tggtgattct	accaacacag	agaagaagt	gggtgaccca	14040
taatgcggaa	aaaggcgac	catctgcagt	cttctccaga	acactggagt	ctgaagacaa	14100
aagaaatctg	cctactgagc	cagaaggag	agaaagtga	ccaacacatc	tttaccaagt	14160
tagaatgtca	cgcattattt	aaaggctgca	aaagccatga	aagacatgaa	agaacacaag	14220
caatttcaac	atgaaagaac	acaagcattc	tcataactcaa	gaatccttaa	gaanaatgta	14280
gtcctaattc	agcccactga	aagttaaatg	tacttaaatg	gctcattaat	gggaacttca	14340
tagcttcaaa	tcagttctgt	cccatctacc	aacctctctc	gcccggtttt	cccgaaatag	14400
tcagcacact	tccctcctac	cagttcttgc	ccctggagtc	tgctctcaga	atagcagagt	14460
gaccacatca	accccacagt	cagagccctc	cagtgccgac	tggtctacaa	agccctctcc	14520
acccccccac	ccacgtgccc	tccggatcct	tgtgacgtgt	ctcctgcata	ccctagcagc	14580
cctggcctcc	tcactgccc	tctgtacat	caggaaaggcg	actccttgag	tcttggtctc	14640
ggcgcctcc	tccacctgca	gtgagttaac	tcccttacct	actctaggtc	attgctcaaa	14700
tgtagcctac	tcaattgggg	cctccctgac	tacctatttt	aaattctaca	tactcccttt	14760
gaccccatgg	acctcactca	cctatttcca	cttttatctc	tacaatttag	cacttgtttc	14820
ctctataaagt	attctaagac	ttaactattt	attacattgt	ttggccacccc	ctctagtaca	14880
taaactccag	agggggcagg	atttctgtct	atttattcat	ttctttatcc	ctaggacala	14940
gaacagggca	tagttcagag	tattcaatgt	tatcaatgaa	tgaactagca	gtagtaccag	15000
ttccagtttag	gcacagaatt	aaatctaaat	agaattaaat	ctcattggtct	gggttaacta	15060
tggaatagaaa	attagatata	attttaagaa	gcctagaaag	aaaaaatata	taagttaaaa	15120
ataatattaa	tttgataata	ataacaaaaa	ctctgccagg	cactgtggct	caaatctgca	15180

-continued

atccagccta	ctcaggaggc	tgaggtggaa	ggatcacttg	agaccagagt	tcaagactca	15240
gcctaggcaa	cacggcaaga	aactgtctct	aaaaaaatta	aaacttaaat	ttttaaaaaa	15300
gaatttcaa	agcgtcacia	aaactggaga	ttaagggtaca	ggaagtgtga	agtaaatatta	15360
ctatgcta	at	ggtttttttt	ttttttagaa	aggatatacc	aaaagatttc	15420
cgataaaactg	agaaagataa	gcatactctc	caattaacag	agggggagga	aaagccagat	15480
acaacaaaat	aagatataaa	ttagttttcca	gttgaaaaca	agagtaggag	ttattttgca	15540
tcaccttaacc	tgtgaacctc	ccacggccaa	aaaaacctac	tgataaacag	ggtagaaag	15600
catcatctca	gataaagcag	gaaaaactgc	cacagtctca	aaccacaaac	tataagcaca	15660
cacctggcca	accctgccaa	gtctgggctc	agtagggagga	acgtgctgag	agctaggatg	15720
taccaactta	gacattctgt	gggatacaga	tgtccctgga	agggtcacac	catctcaag	15780
gcacctgtaa	tgcccactga	ttacagccac	catatgtgag	agagaaactc	agggcactta	15840
gagagtataa	caagaacctt	atgtcatctg	agatggagaa	tcttcagccc	tgcataattaa	15900
ccaactcttt	agacaactg	gcaaaacata	aataaccaca	actttgtttt	cagtaattcc	15960
actcttagat	atcaatccaa	agtaactgag	acagcagata	cacacacaaa	atggtattta	16020
ctgcagcatt	gtttataata	gcaaaaaaca	agaaataatc	catatgtctc	aataggatgc	16080
tggtgtacatg	aggggtatgta	cccatcattc	aaccatcaaa	aagagtata	tggtgtcca	16140
cagatggaca	taaaaagctg	tgtgttacgt	gaaacacaa	tcaagcagca	gcaggatggg	16200
cttatgatag	tcagtatgag	ctaatttctg	gaaaaaaaaa	tctagtgtgt	gcacagaaaa	16260
catctgaag	aacagaaaaa	aaactatcag	cagaatattg	agatgtttta	ctaagttgta	16320
tatctatact	gcttgtaatt	ttaccccaaa	gcaagaatta	ctttttggaa	aaagaaaatt	16380
caggaaataa	agcatttctt	taaaattcat	gtttaaacaa	atgggtgatgg	aataaaaag	16440
ttcttattca	tcataaacac	acacagcaca	catgcacgca	tgtgcgtgag	cacacccttt	16500
acttgataaa	tacctgttg	aataattttg	tctttccttt	taggttctat	cccttcactc	16560
aaaatcggtt	tataaataaa	tgtacttttc	atgtgccttc	tgccataaac	cactttaata	16620
tacctttaca	gtcccattat	cattatagtc	tcaagcctag	actcagcctg	aaactacctt	16680
ttcatttggc	acccttatta	aaatgcacaa	tccagctcct	tcaaatataa	acaaacctta	16740
ggacctgaca	ctaggcttcc	tttgttgcta	ctcataaatg	ccaagttctg	tgcttataat	16800
acatcttctt	tcatttttat	gctacatata	caagggtttt	atatgttttt	cttattatat	16860
cttaattcaa	aacaccatca	cgtcttttct	cagatgaaaa	taaggaaaag	aaattgagca	16920
actgactgac	ttaaaggtoa	taaaactata	tagtagcaga	gtcagcaaaa	gaagaaacac	16980
acatctccca	agtagaggct	gaaaaccagt	accattccac	tccagggtga	gotatataca	17040
gattacaag	tcacctctct	taaatgttca	aactgaatcc	cataccata	ctttaccact	17100
acctcgtaag	aacagcctca	gatcttgta	tagccttttt	tttagcatgc	tgaagccaat	17160
aaaatgcttc	ccattcagca	agagaaacaa	gttcigaaac	actgaataat	ctgccccagg	17220
ccctatgaaca	tttccactgt	gagaaatggt	ctccactgtg	tggagaagat	ccttactctt	17280
ctccacacag	gcggaacatt	agaaaaatto	ttgattctta	tgatgcacag	cttaggagtc	17340
tgtttagcac	aatttaagtc	caaatagtta	ttaaatccctc	ctctgttcca	gaaacagtgc	17400
taaatactgt	gaatataaaa	attgaaaaga	tactctcctg	gtcccaaga	aagtcagcca	17460

-continued

<hr/>						
gatagaggag	acacaggcac	acaaatcaact	gtccatgaa	gctctacctc	cctaacttca	17520
aacgaggggcc	taagtcacca	agaatcacagt	agcagttgtg	actacgagta	actactalaa	17580
ttcaatacctt	tatcttcctt	tagaaaaactc	ttctcccttg	gaattttatt	tgcattttcta	17640
aataccatttc	cttactaaaa	ggagncaggg	ctcttggggg	aaatagctga	ttctaggtgt	17700
ggactatgaa	atgaaaaatgg	tgagtcctggg	acatcccatg	ttgoccagaa	atcaaggaaac	17760
tgcccaaaaga	ttacacagagt	catgttaaat	ggacctaaaga	gtgaaccaga	aggagctcac	17820
tttgcccccgc	gtggaaacaat	ttcaagaaaa	acatgacagt	aatgaattat	aaaacatgaa	17880
ttaaaataca	tattggtact	aaaaagagaa	caaaaggatg	tggttttggg	taaagctctt	17940
cttcattgaa	gaataccagc	taataaatgt	aaaggaaatg	agagaattag	aaaaattatc	18000
attttgtaaa	cottaataia	ttcacctaga	catgotaaaa	ccactgagta	aaaggctgct	18060
tgsgaagagg	atgctccat	gatctcagag	tttcacacca	cagataattt	attagataca	18120
ggaaggaaga	tgtgatcaag	cttctgtga	ccccccgca	ggccccacaa	cactatgtgc	18180
ctctctgtga	tgtgggagct	acacagcaco	gcccacacag	cttctcgcca	aaactgtttg	18240
aagctaatca	caagggaaga	actggacagc	ttctgacct	gagacgctcc	accagacaaac	18300
ttgcttggcc	tatccaaaga	aaacttcttg	gctctctcaa	agaaaaetca	gtttcattta	18360
aaacaaaaac	taattattta	aaaacaaacg	aaagcgaagt	tgtggacttg	agctccaggg	18420
acagagcaga	catacttttc	cctgttcttc	ccagtaagtg	gtaataaaaa	ccctcaacac	18480
tagatataaa	acaaatataa	gaaggttctg	gaaggggaag	aggaggcaga	ctatccaggt	18540
gccttgaggc	ccacagaaca	accagtgat	gggttccactg	ggtctctctt	ttgtctcatt	18600
atctcagact	tggagctgaa	gcagcaggca	actctaaaaac	accaaggggc	acagattgaa	18660
aaagcccaag	aaaagcctgc	cctctctagc	caaaggacca	ggaaggagac	agtctaataga	18720
gatggaacac	atttagacag	taactgccca	tttaccagca	ataactgagc	agggagccta	18780
gacttccagt	cttgtgagga	cgtaaccaagg	taaccaacac	ccccaccaag	gctgagttaag	18840
gactgcgact	tttatccctg	catggcagta	gtaaggagcc	catccctcac	ccgcagcagc	18900
tgtcaggggg	acctggactt	ccactccac	ccaggagtgga	tgaggccctc	cttgctgggg	18960
tcattgtcaga	ggnggacctag	tggagattca	gtgacttaac	cttttcccaag	agataatgag	19020
gccacetttc	ctccctcttc	ccccatgggtg	acagtgaag	cactgtggca	agcagtaggc	19080
actccatccc	ctccatgcca	gggaggtatc	agggaggcca	agtagggaaac	cagaataccc	19140
acaacccccc	agcagcaaca	gggggtcccc	accccattgg	gtgtcaatgg	aagcagagcg	19200
gaaagcctgg	atattttacc	ccatctagaa	gtaaccaagct	gatgtccccc	ttcttctact	19260
acaaatggtg	tcaaaacagg	tttaataaag	gtctagagtc	tgataacgta	atacccaaat	19320
cgttgaaagt	ttcattgagg	atcatttata	ccaagagtc	ggaagatccc	aaactgaaag	19380
agagaaaga	caattgacag	acactagcac	taagagagca	cagattattag	aactacctga	19440
aaagatgtta	aagcacalat	cataagccctc	aacaggctgg	gcgcgggtggc	tcacgcclgt	19500
aaacccagca	ctttggggagg	ccgaggcagg	tggatcacaa	gatcaggaga	tcgagaccat	19560
ccgtgctaac	ccgggtgaac	cccgctctca	ctaaaaatac	aaaaaaaaat	agcaaggcct	19620
ggtggtgggc	acctgtagtc	ccagctactc	gggagcctga	ggcaggagaa	tggcatgaac	19680
ctgggaagag	gagcagtgag	ccgagatcgc	accaaccgac	tccagcctgg	gcaacagagc	19740

-continued

aagacttcgt	ccccaaaaaa	aaaaaaaaaa	aaaaaaaaagc	ctcaacaaac	aactcacaac	19800
gtgcttgaaa	caaatgaaaa	aaaaatcttg	gcaagaaat	aaaagatata	tattttggcc	19860
aggtcagctg	gtcacacagcc	tgtaatccct	gcactttggg	aggctgaggc	aggcggatca	19920
cctgaggtca	ggagttttgag	accagcctga	ccaaacttga	gaaccccggt	ctctactaaa	19980
aatacaaaat	tagccagtca	tgggtggcaca	tgcctglaat	cctagctact	caggaggccg	20040
aggcaggaga	atcgcttgaa	ctcaggaggt	ggaggttgcc	gtgagccgag	atcccgccat	20100
tgcacattgc	actccagcct	gggcaacaa	agcaaaactc	catctcaaaa	aaatagatac	20160
atattttaat	ggaattttta	gaatttgaaaa	atacagtaac	caaattgaat	ggaagacaaa	20220
catagaatgg	agggggcgaga	caaaataatc	agtgaacttc	aacagaaaaa	aatagaaaatt	20280
accaaatatg	aagaacagaa	agaaaaataga	ctggccaaaa	aataaagaag	aaaaaagagg	20340
agcagcagga	ggaatgatgg	aaaaagagaa	aggaagggaag	gaagggaag	aggaggaggaa	20400
ggagtgaggg	agaaagtctc	aaagacctct	gagactaaaa	taaaagatct	aacacttgct	20460
atcagggctc	aggaagagaga	caaagatggc	acagctggaa	acgtattcaa	aaaaataatg	20520
ctgaaaaactt	cccaaatttg	gcaagagaca	taaacctata	gattcgaaat	gctgaacccc	20580
aaataaaaag	cccaataaaa	tccacaccaa	aatacctcat	agtcacactt	ctgaanaagc	20640
gaaaagagaa	aacgtcttga	aagcagtgag	tgaacaacaa	cttcattgtat	aagggaaaaa	20700
caattcaagt	aacagatttc	ttacagaaat	taagggaagc	agaaggaaat	gacacaaatg	20760
ttttcaagtg	ctgaagaaaa	agaagtgtca	acacaaaatt	ctagattcag	taaaaatata	20820
cttoaagaat	caatgggaaa	tcaagacagt	ctcagataaa	gcaaaataag	agaatatggt	20880
gccagcagat	ctccctctaa	ggaatggcaa	aagggaagtc	atgcaacaga	ccaaaaaatg	20940
atgaagaag	gaatccagaa	acatcaagaa	gaagagaata	acatagtaag	caaaaaatac	21000
tgtaatatca	ataaaaattc	tatctcctct	taagacttct	aaattatatt	gatgggtgaa	21060
gcaaaaatta	taaccctgtc	tgaagtgctt	ctactaaatg	tatgcagaga	attataaatg	21120
gggaagtat	aggtttctat	acctcattga	agtggttaaa	tgacaacact	gtgaaaagtt	21180
acctacacac	accacagtta	gtatatataa	atatatgtgt	gtatatgtgt	gtgtatatat	21240
atctatccat	ataatgtcat	acagcaacca	ctaaccaacc	tctaccaaag	gataataacc	21300
aaaaacaatt	tagataaaat	gaattggaat	tctaaaaaat	attcaaatac	tctacaggaa	21360
gacaaagcaa	aaagagaaaa	aaagaggagg	acaaactaaa	ttttttaaaa	acataaataa	21420
aatggtagac	ttaagcccta	acttatcaat	aattacataa	atgtaaatga	tctaattata	21480
tcaattaaaa	gacagagata	gcagagttaa	tttaaaaaaa	tagctataag	aaacctgctt	21540
tgggctgagt	gcagtgactc	acacttgtaa	tccagcactc	tggggaggcc	aaggcgggtg	21600
gatacactga	ggtcaggagt	tccagaccag	cctggacaac	atggtaatac	cccatctcta	21660
ctaaaaatac	aaaaaaatta	gccaggcagt	gtgggcacag	cctgtagtcc	caactactca	21720
ggaggctgct	acacaagaac	tgcttgaaac	cgggcagcag	aggtagcagt	gggccaagal	21780
tgcgccactc	cagcctgaac	gacagagtga	gactccacct	cagttgaaaa	acaaaaaaga	21840
aacctgcctt	aaatatacaa	acatatgttg	gttgaatta	aaagaaataa	atatatcatg	21900
aaaacattaa	tcaaaagaaa	ggagtggcta	tattaataac	ataaaataga	cttcagagaa	21960
aagaaaaatt	caagagacag	gaataaaaag	atcaagaaaa	gatcctgaaa	gaaaagcagg	22020

-continued

caaatcaatc attctgcttg gagattcaac accctctctt aacaactgat agacaaccta	22080
gacaaaaaaa tcagcaltgga gttgagaaga actlaaacacc actgaacaac aggatctaal	22140
agacatttac ggaacactct acccaacaat agcaaaataa acattctttt caagtattca	22200
ctgaacatat ccttagaccc taccctgggc cataaaacaa agctcactag tgattgcga	22260
aggcttggat ggcacagtga agagctgcat ggggagggag aaggtgacag ttaagagtg	22320
taggatttct ttttgggata atgaaaatgt tccaaaattg attgtggtga tgttggcgca	22380
actotacaaa tataaaaaag gccattgaat tgaagttttt aagtgggtga aacatattgt	22440
atgtggatta tatctaacgc tttttaaaaa cttaacacat tcaaaagaat agaagtcata	22500
cagagtgtgc tctactgaa tcaaaactaga aagaggtaac tggaggataa cgaagaaagc	22560
ctccaaatac ttgaaaactg gacagacat ttctaaaato atccgtgggt caaagatat	22620
cattttctgat attcattttt attgtttaat gtatttttaa aaatttctta agggaaataa	22680
actgactaaa aatgaatatg gctgggtggc gtggttcacg cctgtgatcc cagcactttg	22740
ggaggccgag gctgttggat cacaagatca ggagtlcgag accagcctgg ccaagatggt	22800
gaaccccgct ctcaactaaa aaactacaaa aagtagcnaa gcgcagtggc gggagcctgt	22860
ggtcccagct ccttgggggg ctgaggtagg agaattcgctt gaacacagga agcagaggtt	22920
gcagttagcc aagattgtgc cactgcacgc cagcctgggc gacagagact gcccaaaaa	22980
aaaaaaaaaa aaaaaaata tcaaaatttg tgggacatag ttaagcaat gctgagagg	23040
aaatttataa cactaaatgt ttacatlaga aaagagaaaa agtttcaat caatagtctc	23100
cactcccatc tcaagaacac agaagatgaa gagcaaaata aacccaagc aagcaaaaga	23160
aagaaatat aaaaaataat cagtaaaatt gaacaacgaa acacaataaa gaaatcagt	23220
gaacaaaagt actgattctt cgaagatta ataaaattga caaacctcta gcaaggctaa	23280
caacaaaaaa agaaagaaga cccggattac cagttattag aatgaagca taattagaaa	23340
caactctaca cattataaat ttgacaatgt agatgaatg gactaattac tgaanaaaca	23400
caaatcacca caactacacc aatatgaat agataatttg gatagcctga taactactga	23460
gaaatttgaa tttgtaatat taacactctt aaaaacgaaa cattaacctt aatattttat	23520
aaattattga taaggtaatt atcccttcc ttacaaata aaaaacgaaa attattttgc	23580
agctaaagag atgtatgtac tgtgaaaaat atcttcagaa aaatagaact ttgtttgaag	23640
aataaggatt taaaaaatgt ttttaactct caagaagcaa atatctgggc ccagatgggt	23700
tcactgaaga attctaccaa atgtttaatg aagaattacc accaactcta catagcatct	23760
ttgagaaaaa tgaagagaag ggaacatctc ccagttcatt ttatgaagtg ggtgttactc	23820
tgatactaga actgtalaag gacagclact ctlgacacac tgccctatggg tagctctgcl	23880
ctgcaggaac agtcagaaaa aaaaaaaaaa gaagcactgg acaagggcag tataaaaaaa	23940
gaaaactggg ccagggtgcag tggctcacac ctgtaattctc agcaactttgg gaggtgcag	24000
ctggtggatc acctgaggtc aggagtttga gactagcctg gccaacatgg taaaaccctg	24060
tctctactaa aatacaaaaa ttagccaggc aggggtggtg ggaanaataa aaggaaaaaa	24120
aaacaaaaat aaactgcaga ccaatatcct tcatgagtat agacacaaaa ctctttaaac	24180
tccttaacaa aatattagca agtagaagca atatataaaa ataattatac accatgatca	24240
agtgggagctt attccagaaa cgaagtcctg gtccaacatt tgaaaaaag gtaacccact	24300

-continued

atatgaacgt	actaaagagg	aaaactacat	aatcacatca	atcaatgcag	aaaaaagcat	24360
tlgcctaaat	ccaatalcca	ttcatgatac	tclaatlaaga	aaaataagaa	taaaagggaa	24420
attccttgac	ttgataaagc	ttacaaaaga	ctacaaaagc	ttacagctaa	cctatactta	24480
atggtgaaaa	actaaatgot	ttccctacg	atcaggaaac	aagcaaggat	gttcaactct	24540
attgtcttta	tttaacatag	ccttgaagtt	ctaacctgtg	caaaacgata	agaaagggaa	24600
atgaaagacc	tgacagattgg	caaagaagaa	ataaaactgt	tcctgtttgc	agatgacatg	24660
attgtctcat	agaaaaatgta	aagcaactag	gggtaggggg	gcagtggaga	caagctgggt	24720
aaaggatacc	aaatttcagt	taggagaggt	aagttcaaga	tacctatttg	acaacatgggt	24780
aactatactt	aatatattgt	attcctgaaa	atactaaaag	agtgggtgtt	aagcgttctc	24840
accacaaaa	tgataactat	gtgaagtaat	gcatacgta	attagcacia	cgtatatatt	24900
tcacaaacat	catgtgttac	atgataaata	cacacaattt	tatctgtcag	tttaaaaaa	24960
catgattttg	gocaggcaca	gtggctcata	cctgtaatcc	cagcatttta	ggaggctgag	25020
gcgagcagaa	aactttaggt	cgggagtttg	agacagaaal	ggtcaacala	gtgaaatccc	25080
gtctccacta	atnatacaaa	aattagcagg	atgtgggtgg	gtgcacctgt	agacccaggt	25140
acttgggggg	ctngaggcaag	agaatttgct	gaacaaagga	ggcagagggt	gcagtggagt	25200
gggtgccact	gcattccagc	ctgggtgacg	agtgagactc	catctcaaaa	aaaataaaat	25260
aaagcatgac	ttttcttaaa	tgcaaaagcag	ccaagcgcag	tggtcatgct	ctgtaatccc	25320
accacttttg	gaggccgagg	caggcagatc	acaaggctcag	gagittgaga	ccagcctgac	25380
caacatgggtg	aaaccccac	tctactaaaa	aatatataaa	ttagccaggc	atgtgttagtc	25440
tcagctcactc	aggaggctga	ggcaggagaa	tcacttgaa	ccggaggcag	aggttgcagt	25500
gttgagccac	cgcactccag	cctgggtgag	agaaacgagac	tcctgtctcaa	aaaaaaaaag	25560
caaaataacc	taatttttaa	aaactaaaa	ctactaagtg	aattcagtaa	gtcttttaga	25620
ttcaggatat	atgatgaaca	tacaaaaatc	aattgagctg	gacaaaggag	gattgtttta	25680
ggtcagtagt	ttgaggctgt	aatgcacaat	gattgtgcct	gtgaatagct	gctgtgctcc	25740
agcctgagca	gcataatgag	accacatctc	tatttataaa	aaaaaaat	gtatctctat	25800
gtactagcaa	tangcacatg	ggtaactaaa	ttaaaaacat	actaaatact	gtttttaatt	25860
gcttgaaaaa	aatgaaatac	ttacataata	atctaacaaa	atgtgcagga	cttgtgtgtc	25920
gaaaactaca	aaacgctgat	aaaagaatc	aaagaagact	taaatagcgt	gaatatatac	25980
atgottatag	gttggaaaa	ttaatatagt	aaagatgcca	attttatcca	aattattaca	26040
caggataaca	ttattactac	caaaatocca	gaaaaatttt	acatagatat	agacaagatc	26100
alacaaaaat	gtatacggaa	atatgcaag	gaaclagag	agctaaaaca	aatttgaaaa	26160
agaaaaataa	agtgggaaga	atcagttctat	ccagtttcaa	gaattacata	gctacagtaa	26220
tcagagctgt	gatattgaca	gagggaacgc	tatagatcaa	tgcaaccaaa	tagagaacta	26280
agaaagagac	acacacaaat	atgcccaaat	gatttctgac	aaaggtglla	aaacacttca	26340
acgggggaag	atatgtctct	cattaaaggg	tgtagagtea	ttgcacatct	ataggcaaaa	26400
agatgaacct	gaacctacaa	cctacagaa	aaatttaact	aaatgactc	aaggactaaa	26460
cataagatat	acatctataa	aacatttaga	aaaaggccac	gcacggtggc	tcacgctcgt	26520
aatcccagca	ctttgggagg	ccaaggcagg	tgatcacct	aaggtcagga	gtttgagacc	26580

-continued

agcoggatca acatggagaa gccccatctc tactaaaaat acaaaattag ctggacgtgg	26640
tggcaacatgc ctgtaaalccc agctactttgg gaggtctgagg catgagaaac gcttgaaccc	26700
ggggggcaga ggttgccggtg agccaaagatc acaccattgc actccagcct gggcaacaag	26760
agcaaaactc caactcaaaa aaaaaaaaaa aaaggaaaaa tagaaaatct ttgggatgtg	26820
aggcgaggta aagaattctt acacttgatg coaaactaag atctataagg ccagtcgttg	26880
tggctcatgc ctgtaattcc agcacttttg tcaactagat gaaaggtata tgggaattca	26940
ctgtattatt ctttcaactt ttctgtagg ttgaatttt tttagtaaaa aattggggga	27000
aagaccctgac cagctggctc acacctgtaa tccagcact ttggggaggcc gggcaggtg	27060
gatccacagg tcaggagtgc gagaccagcc tggccaaact ggtgaacccc cgtctctacc	27120
aaaaatataa aaaattagcc ggggtgtoatg gtgcattgcct gtaatcccag ctactgagga	27180
ggctgaggca ggaagaatcac ttgaacctgg gaggtggaag ttgcagttag ccgagattgt	27240
gccaactgac tccagccttg ggtgacagag cgagactccg tctcaaaaga aaaaaaaaaa	27300
aaagaatata aaacgcttac tttagaaact atttaaggga gccagaattt aattgtatta	27360
gtattttagag caattttttat gctccatggc attgttaaat agagcaacca gtaacaatt	27420
agtggagtgc aaacagctgt aaatttgcta actgttttag agnagagccc tatcaatata	27480
actgtcattt gagggctgaca ataagcacac ccaagctgt accctcttga ggagcaacat	27540
aaaggggttta accctgttag ggtgttaatt gtttgatat ggtttgttg gcccccaga	27600
glctcatgtt gaaatttgtt cccagtaact ggaggtgggg ccttattgga aggtgtctga	27660
gtcatggggg tggcatatcc ctccatgaatg gtttggtgcc attcttgag gaatgagtga	27720
gtcttacttc tttagtccca caacaactgg ttattaaaaa cagcctggca cttccccc	27780
tctctcgctt cctctctcac catgtgatct cactggttcc cttcccttt atgcaatgag	27840
tggaaagcagc ctgaagccct cgccagaagc agatagtgat gccatgcttc ttgtacagcc	27900
tacaaaacca tgagcccaat aaaccttttt tctttataaa ttatccagcc tcaggatttc	27960
ctttatagca agacaaatga accaagacag ggggaaatca acttcattaa aataatctat	28020
gcagtcacta aacaaataag aacaagcggc tccagcagtg ggaagccaat acccagagtt	28080
ccacaaatcc agtatctgaa aagtcacgtt tccaaaccaa aatatatata atacaggccc	28140
gacatggtag cttatgtctg taatccagc actttgggat gctgaggcgg gcagatcccc	28200
ctaggtcagg agttccagac cagcctggcc aatatggcaa aaccccgtct ctactaaaa	28260
tacaaaaatt agccaggcat ggtggtggat gctgtaatc ccagctactc gggaggctga	28320
ggcagggaat caactgaacc caggaggcag aggttgcaat gagccgagat cagccactg	28380
aactccagcc tgggcaacaa agtgagactc cacctcaaaa aaaaaaaaaa tatacatata	28440
tatatgtgtg tgtgtgtgtg tgcgcgcgtg tgtgtatata cacatcacaa tatatacata	28500
tatacagaca ccatatataa tatgaagcat gaaaagaaac aaggaaagtat gaacccatct	28560
lctgtgggtt atgataggat gggglatcac gggggaagta gacaagggaa actgcaagt	28620
agagcaaaac gttatcatat ttaacagaaa aagacttttg agtaaccatt ataaatatgt	28680
cccagaaatt aaagaaagc gtgattaaaa aaggaaagga aagtatcata acantattac	28740
tccaaataga gaatatcaat aaaggcatag aaattataaa atataatata atggaatttc	28800
cggagttgaa aggtagaata actaaaaatt aaaattcact agagaagggt caacctata	28860

-continued

tttgaactgg	cagaagaaaa	atttagtgag	acaaatatac	ttoaatagac	attattc0aa	28920
tgaaaaataa	aaagaaaaaa	gaatgaagaa	aaataaacag	aalcacagca	aaatglggca	28980
caccattaat	cacattaaca	tatgcatact	gagagtaccg	gaagcagatg	agaagaggga	29040
agaaaaata	ttcnaatgat	ggcagtaac	ttoctagatt	tttgttttaa	agcaataacc	29100
tatacaatca	agaaactcaa	tgaattccaa	gtaggataaa	tacaaaaaga	accacaaaca	29160
gatacaccat	ggtaaaaatg	ctgtaagtca	aaaacagaga	aaatattgaa	agcagctaga	29220
ggaaaaatta	taagagaaac	tcaottacaa	aagaacatca	cttatanaag	aaccacata	29280
atagaaacag	ttgacctctc	atcagaaaca	atgaatgata	acatatattga	agtgcctcaa	29340
gaaaaaaat	aaagattcct	atatacgaca	aagctgtctt	tcaaaaaat	acatccaaaa	29400
ggattgaaac	cagggtcttg	aagagtatt	tgtaacatcca	tgttatagc	agcattattc	29460
acaatagcca	aaaggtagaa	gcaacccaag	ggcccatcga	caaatataa	aaatgtggta	29520
tatgtataca	caatggaaat	tattcagtat	taaaaaggaa	tgaattctg	acacatgcta	29580
caacatggct	aaaccttgag	aacactalgc	taagtgaat	aagccagcca	caaaaggaca	29640
aataccatat	tacttcactt	gtatgaaata	cctagggtag	tcaaatccag	agatagaaag	29700
taaaacagtg	gttgccaagg	gctgagggag	ggagtaccgt	ggagtatttg	ttgaatgggt	29760
acagaatttc	agttttgcaa	gataaaaaa	gttctggaga	cagatgggtg	tgaggggtgt	29820
acaacaatac	aaatatactt	tatactactg	aacagtatac	ttaaaaatga	ttaacatggt	29880
gaaacccctg	ctclactaaa	aalacaaaa	aattlagctgg	gtgtggglggc	gggcacctgt	29940
aatcccagct	acttgggagg	ctgagggcagc	agaattgctt	gaaaccagaa	ggcggagggt	30000
gcagtgaagt	gagattgcgc	caccgcactc	tagcctgggc	aataagagca	aaactccgtc	30060
tcaaaaaata	aaaaataaaa	aaaatttaaa	aatgattaa	caggaggcca	ggcacggctg	30120
ctcacaccta	taattgccagc	actttgggag	gccgaggcag	gcgatcactt	gagaccaggga	30180
gtttgagacc	agcctggcca	acatggcaaa	accctgtctc	tgtataaaat	acaaaaatta	30240
gccaggcatg	gtggcatata	cttataatcc	cagctactgg	tgagactgag	acacgagaat	30300
tgottgaacc	caggaggcag	agattgcagt	gagtcagat	cgcgccactg	aattccagcc	30360
tgggcgacag	agcaagattc	tgtctcgaaa	aaacaaaaac	aaaaacaaa	agcaaaaccc	30420
aaaaataaatt	aagcaggaaa	cgagattgct	gctgaggagg	agaaagatgt	gcaggaccaa	30480
ggctcatgag	agcacaaaa	ttttcaaaaa	atgttttaaty	attaaaaatg	taaatTTTTat	30540
atgtatctta	ccacaaaaaa	aagggtctgg	gggcaggaaa	tgaagggtgaa	ataaagacat	30600
cccagagaaa	caaaagtaga	gaatttggtg	ccttagaaga	aacaccacag	gaagttcttc	30660
aggctgaaaa	caaglgaccc	cagagggtaa	tctgaattct	cacagaaaa	tgaagcatag	30720
cagtaaaaggt	tattctgtaa	ctatgaaact	aacaatgcac	atTTTTtctc	ttcttctctg	30780
aaatgattta	aaaagcaatt	gcataaaata	tatatataaa	agcctattgt	tgaacctata	30840
acalatalag	aaatatacct	gtaataatct	tgcaataaac	tgcaaaaaag	agagtlggaa	30900
caaaagctgt	actaggctaa	agaaattact	acagatagta	aagtaataata	acagggaact	30960
taaaaataaa	atTTTaaaaa	atTTTaaaaa	ataaattaca	acaaataata	gggtggggtt	31020
gtaatattaa	tagacataat	acaaaaatac	cacaaaaagg	gaagaagaca	atagaactac	31080
ataggaaata	catTTTggta	tctaactaga	attaaattat	aaatatgaag	tatatctctg	31140

-continued

taagttaaga	cacacatggt	aaacccctaga	tactaaaaag	taactcacat	aaatacagta	31200
aaaaaataaa	taaaaataalt	aaaatgittg	tattagtttc	clnaggglac	aglaacaaac	31260
taccacaaat	tgaagtggctt	aacacaaactt	aaatgtattt	tctccagtt	ctggaggcta	31320
aacacctgca	atcaagggtga	gtacaggggcc	atgctccctg	tgaaggctct	aggaagaagt	31380
ctctccctgt	ctctccagc	ttccagtggt	tctcagtaac	cctaagtgct	cttgggttg	31440
tagctatata	cttccctagca	accagaaaga	agaaaaaat	aaagattatg	gcaaaaaata	31500
atgaatcaa	agggagaaaa	atggaaaaaa	ataaataaaa	ccaaagcta	gttctttgaa	31560
aagatcaacc	aagttaacaa	accttttaac	tagactgaca	aaaaggagggt	aagactcaaa	31620
ttactagaat	cagaaataaa	agagggggaca	ttactaatga	gggattagaa	aagaatacta	31680
ogaacaaatg	tgtgcocaaa	aattagaaaa	cttagatgaa	atggacagggt	tcctaggaca	31740
acatcaacta	ccaaaaattta	ctcaagaaga	aagagacaat	ttgaatgagc	tataacaagg	31800
gaagagactg	aattgcaaac	caagaacta	tcacaaaga	aaatccagg	ccagagaagt	31860
ttactgtgta	aattctttta	aacttataaa	tataaattaa	catcagttct	tcacaaactc	31920
ctcaaaaaaa	aagaaacagat	ctctattttac	agggatcacg	atcttttagaa	aatcctaagg	31980
gaactactaa	gacactatga	taactgataa	acaagttcag	caaggctgca	ggatagaaaa	32040
ccaatataca	aaaatctatt	atatctctat	acacttgtag	tgaacaaccc	aaaaatgaga	32100
ttaagaaat	aattcaattt	acaataacat	caaaaagaat	aaaaacactc	aaaaataaat	32160
ttattcaagt	aagtgcacaaa	cttatactct	agaagctaca	aaacactggt	aaaagaaatt	32220
aaaggtttac	ataaatgaaa	aactatocca	tgttcatgga	tcaaaagact	tattactggo	32280
aatgctctcc	aaattgatct	ataaattcaa	caaatctcct	atcaaaatcc	cagatgaggc	32340
tgggggtggc	ggttcatgcc	tgtaatocca	gcactttggg	aggtcagggc	acgcagatta	32400
cctgaggctg	ggagctcgag	atcagcctga	ccaacatgga	gaacacctat	ctcttctaaa	32460
aatacaaaat	tagtcaggcg	tgggtggcaca	tgcctataat	cccagctact	cgggnagctg	32520
aggcaggaga	atcgcttgaa	ccaggagggo	agaggttgca	gtgagcacaag	atcgctgcat	32580
tgcactccag	cctgggcacac	aagagcaaaa	ttccatctca	aaaaaaaaaa	aaaaaaaaatc	32640
ccagatgaat	tcactgttga	aattgaanaag	attattctaa	aattccatg	gaattgcaag	32700
accttgagaa	tagccaaaaac	aaacttgaaa	aacacgaaca	aaatatagga	tgaactcactt	32760
gccaattgca	aatgtttacga	cacagcaaca	gtaatcaaga	ctgtgtggta	ctggcaaaag	32820
acacatacat	acatacatat	caatggaata	taattgagag	tacagaacaa	agcctaataca	32880
tctatggtaa	gtgctttttct	atTTTTTTTct	TTTTTTTTT	ctTTTTTgta	gagatagaat	32940
ctacacatgt	tgcacagggt	ggtcttcaac	ttctgggtct	aagcaatcct	cccactgtgg	33000
ctccccaag	tgtcgggata	actggcatga	gccaccacat	ccagcccaga	tgaatttcaa	33060
aaaagtcaac	aagaccattc	ttttcaacaa	ataggtcttg	gatgatcaga	tagtcaacatg	33120
aaaaaaaaaa	tgaagtlgga	ccctccatca	cactaaagtg	clcgallat	aggcacacgc	33180
caccacatcc	agcccaaatg	atTTTcaaaa	aggtcaacaa	gaacattctt	ttcaacaaat	33240
aggtctggga	taactcagata	gtcacatgaa	aaaaaaaaag	aagttggacc	ctccatcaca	33300
ccetatgcac	aaataaattc	aaaaatgaat	tgatgactta	aacgtaagag	ttacgactgt	33360
aaaactctta	gaaggaaaaca	tacgggtaaa	tcttaagac	gttaggtttg	acaaagaatt	33420

-continued

cttagacatg acaccaaaaag catgaccaaac taaggtaaaa tagggtaaat tgtacctacc	33480
aaaalgaaaa acccttgtgc lggaaggac accatcaaga aalggaagc caaaatagcc	33540
aaggcaatat taagcaaaaa gaacaaagct ggaggcatca tactacctga cttcaagaca	33600
acagtaacca aaaaagcatg gtactagttag aaaaacagac acatagacca atggaacaga	33660
ataaagaacc caaaaaataa tccacatatt tatagtcaac tgatttttga caatgacacc	33720
ccttcaataa atgatactag gaaaactgga tatcgatatg cagaagaata aaactagacc	33780
oatatototc accatataga aaaaacaaat cagactgaat taagaagcttg aatgtaagac	33840
ccaaaactat aaactactg gtagaaaaaa taaggaaaaa cgttcaggga catgtgtcca	33900
ggcaaagatc ttatggctaa aacctcaaaa acacaggcaa caaaaaaaa aatggaaaaa	33960
tagoacttta ttaactataa aagctcctgc acagcaaaag aaacaacaga atgaaaaagc	34020
aacctgtaga atgggagaaa atatttgcac actatccatc catcaaggga ctagtatcca	34080
gaacacacaa gtgactaaaa caactcaaca gcaaaaaagc aataatctg gtttttatat	34140
gggcaaaaaga ttgataaaaa cattctcaaa ggaagacata caaatgtcac tatcattctg	34200
ccagtaccac actgtcttga ttacttgtta gtgtataaat ttttaaatg ggaagtgtga	34260
gtatctctac acccttgtct tgtttttcaa gtttgttttg gotattctgg gagccttgca	34320
agtataaaat agccaacaag tatgaaaaaa tgctaccatc cactaatcat cagagaaaaa	34380
aaaatcaaga ccaatatgag atatctctct actccagtta gaatggctac tatcaaaaag	34440
acaaaatata atggatgctg gcaaagattt ggagaaaggg gaactcctat acactgtggg	34500
tagggatgca aatgtgtaat ggccattatg gaaaaataa ctgaggtttt tcaaaaaact	34560
gaaaantgaa ctaccatatg atccagcaac cctactactg ggtattttat caaaggaaag	34620
aagtacgtat actgaagaaa tatatgcact ctcatgttaa ttgcaacact gttcacaaca	34680
gccaaagacag ggaataaaac taatatgtgca tcaacagatg aatggataaa gaaaatgtgg	34740
catatacaact caatagaata ctattcagcc attaaagag aatgaatcc tgtcatccca	34800
gcaacatgga tgaacctgga ggacattata tttaatgaaa taagtaaaag aaaaaaagat	34860
aaacagtaca tgttctcact cagacatggg tgctaaaaag aaatgggggt caacgaatta	34920
gaaggggagg cttgggaaaa gttaatggat aaaaatttac agctatgtaa gaagaatag	34980
ttttagtgtt ctatagaaat ctaggcgag tatagttaac aataacttat tgtacatgtt	35040
caaaaagcta gaagagattt tggatgttc cagcacaaag gaatgataaa tgtttgtgat	35100
gatggatata ctaattaccc tgattcaatc attacacatt gcatacatgt atcaaatatt	35160
cactctgtac ctcaataata tgtataatta ttacgtcaac aaaaaaagga aaaaaaagaa	35220
aattaagaca aaccacataa tggagaagaa aaaatatctg caaattatat atatctgata	35280
aatatattat atttataata tataaagaac tcttacaact caagaacaaac aacaaaacaa	35340
cccaattcaa aaatgggtaa aagccttgaa tataacacta tctaagaact atatacaatt	35400
ggcaataaaa gacacgaaaa gatgctcaac atcaactagt atcaggggaa lataaatcaa	35460
aaccacaaatg tagaatgtag acaccacttc atatgcacta ggaaggctag aataaaaagg	35520
taataacaaa tgttggtaag gatgtgaaaa aatcagaaac ctcatctgct gctgttggga	35580
atgtaaatg atgcagccac ttgggaaac agtctggcag ctctcaaat tatataaac	35640
agagttacag tatgacccag gaatatctct cctgggtcta taaccaaaaa aatgaaaaaa	35700

-continued

tatatccaca	taaaaacttg	tacatgggca	tttatagcaa	cattattcat	aacagcaaa	35760
glgglaagaa	cccatatgcc	catcalctga	tgaaacaggta	aalaacatgc	gglatlalc	35820
atccactaga	atattatctg	cccatacaag	gagtgacatc	cagotacatg	ctacaaggat	35880
gaatctcgga	aacottatgc	taagtgaan	angccagtc	caaatgacca	cagattatga	35940
lccatgcat	cggaatagac	cagaalaggg	aaatctatag	agacagaaag	tagattagtg	36000
gttgggtggg	gctgggagga	caggtagtac	actactttcc	cagaactact	ggaacaaagt	36060
accacaaact	ggggagctta	aacatagaaa	ttgatcttct	ccagttctg	gagactagga	36120
ctctgagatc	aagggtctag	cagagctggg	tctttctgag	ggccctgagg	caaggctctg	36180
tccagagcct	ctctccttgg	ctggcagggtg	gcatctctct	ccctgcgtct	tcacatcctc	36240
littctctgt	gtgtgccc	gtccaaattt	tgattggctc	attctggglo	atggccaatt	36300
gctatgcaca	aagtgaagtc	tacttccaaa	agaagggaag	agggaacact	gactaggcta	36360
aacttatagt	cattttaaatg	tccgcttttc	ctatgagatt	gtgaacacac	agaagtggg	36420
litttatcta	cattglgcaa	agttlaataa	gaaaaataga	attcaagaga	agcagttcaa	36480
tagcaggaa	ttatattggg	aactaattac	aaggtttagg	gcaggactaa	aaagccagtt	36540
gggatgggtga	gcccacccag	agattagcaa	cagtgggacc	ccatctacct	accacccatg	36600
aagctggaag	gataaaggag	gggctattat	cagagctccac	aagccagtgt	cagagctcct	36660
ggctggagct	gggaccaccc	tagagacact	gtgcaaaagca	gaaaacaagg	gggaaaaacc	36720
ctgacttctc	ccttctctcc	acctllcaat	ctcccactag	tgttctctac	tagccatact	36780
tggccagaga	cagtgacaag	gaacactgca	aaatgaagtt	tgtaggaaac	atctccctct	36840
gagacagaga	aatatggaag	ggtagaaat	gaatccagagg	ataaagagaa	aaaaaccctga	36900
glactatctt	atttatcttt	gtatctccag	tgccaatctc	gtctctcaaa	aaagggaagc	36960
aattgagaga	aactgaaaac	tccaattgaa	atgaaaagaat	ggagaattac	tggactagaa	37020
gagaagagaa	aaattttatc	cgcntagagt	aaacaagaat	ggattcccaa	aggacgtgat	37080
gaatgaaaag	ctataatcag	caaagatttg	ccagagaaat	taaaaagtgg	taaactcagc	37140
acgctgttac	aacctgaagg	cacaatgcac	gaaaacggtt	caagaaatga	caagatttga	37200
agtcnaattc	taagtgcctt	tccagaatct	ctccagacga	ttatatagct	accccatctt	37260
attaaataaa	atggaaactt	actaaacttt	cccttctgat	taactaaca	tatgtcctaa	37320
tagcaaacga	ttctggaatt	cctagagtta	aatatatctc	gtcaaaagtgt	attgctcttt	37380
taatatctctg	ctgacctcct	tttgctattt	aggatatttg	tatacacatc	acacgtaaat	37440
ttggtctata	gtttacatct	acgggcttat	actgttcttt	ttttcatctt	tttaaaattt	37500
ccaaccccca	glatccatct	actgcctctc	atcaggggtta	tittaaactll	gtaaaatcag	37560
ctgagatgct	ttccatgttt	ttttttttta	ttttctgcca	catttgaata	gcataaggagt	37620
taccacacac	aaccttggat	tatttaagca	tccacgatto	ccagtgtgga	ttttttatct	37680
agagctlllc	tgtctatctc	tgctalcacg	acagaaccca	atctcagctll	tcacgctata	37740
ctctaccccc	atggaaattg	cagatgaagt	tcaaaaggac	ctttgcatta	tccctgcctcg	37800
ccctctctcc	ccttcatctta	gacatccact	tctttatagaa	cgtcttacct	gaactgcact	37860
gtccccaacc	cctgctgccc	aattgtgtgc	tctcccggtg	cctggcctcg	catcctcttt	37920
agtaattgac	gtctccctca	tctgtctccc	caccacagaca	ttaagctgaa	tagactggat	37980

-continued

tttgtgtcttg	ttcatcacta	taatctcagc	acctagtagc	tagtaggtac	ttaccatgta	38040
ttcattagca	aaatgtltaig	lataacottg	caccttaaaa	acaagagaag	gaagacaaaa	38100
tttaagtctta	agactatggg	ttagaacatg	gatcagaaac	tacagtctgc	agcccaaatc	38160
cagaccaaat	gaagagagca	tgttcaattta	catacaaacct	atagcagcgt	tcacactaca	38220
ggagcagagc	taagtgttic	caagggaaca	cacggccctg	caaagccctaa	aatattttact	38280
ctatagctct	tcacagaaaa	agttttcaga	tccttcggtt	agaactcttg	ttcatatgca	38340
atttcaactaa	accatagttt	tttgggtttg	tttgggtttt	tttggcaaaa	aggaatgagc	38400
cgatccagaa	aaggttgaaa	agaatgaatc	attactgctg	aagaatgtg	cacacagtcc	38460
gtcagtattc	tgctgcatg	ctgacaccca	tccaatagt	tcattgagatg	cagcagctac	38520
tactgtgttc	tcaatgcga	gtccacccac	tccataacca	tgtccaagca	atcttgggaa	38580
cacatcaccc	atgctgtgtt	atccttaagg	tattgcctca	catacagcag	tggctgtgtca	38640
taaggtcaaa	tgacactagt	ggccaggagg	tcagagagaat	gagtggaggc	aggtgggtag	38700
cagcccccag	ccclagcaac	agcaggagct	cacccctcag	tcactctagc	caggactgaa	38760
atacttttca	ccctttcaag	agagactagg	aattctggatt	tttatgtgaa	atatcttgat	38820
tactaaatgt	tgtaacaga	cattgtcaaaa	ggtaaaacta	agtaagtcca	tggggcagat	38880
tgactattca	ggttatagaa	ttaaggattc	ttatccaaca	cagataccaa	ccaaaaagct	38940
gacgtataac	atattaggag	aaactatgtg	cactgtcga	acatcaacaa	ggggctaatg	39000
tcataaaatg	tcataattgg	altccagltg	aaacatgggg	aaaggacalg	aacaggcaac	39060
ttatgtcaat	ggaaactcaa	aaagataaca	agcatatata	aaagcattct	caaatctagt	39120
agtanaacaga	cagatgcaaa	taanaagagg	gaactgctg	ccgggcccag	tggctcacac	39180
ctgtaatccc	agcaccttgg	gaggccgagg	cgggcggatc	atgaagtccg	gagatcgaga	39240
ccatcctggc	taaacatggg	aaaccccgct	tctactgaaa	acacaaaaaa	ttagccaggc	39300
gtagtgtgtg	gcaccagtag	tcccagctac	tcaggagggt	gaggcaggag	aatggcatga	39360
accagggagg	cggagattgc	agtgagccga	gacctatgca	ctgcactcca	gcctggggga	39420
ctgagtgaaa	ctccatctca	aaaaatatca	taataatttat	attatataata	ataataataa	39480
gtcaataaat	aaaaagagag	agactgctaa	agctcagaaa	gttgaaatgat	gcacagcgca	39540
tgcaaaagatc	agggccctgg	gatggccggg	tgcaagtggc	cacgcctgta	atcccaccac	39600
tttggggggc	caaaagccggc	ggatcatgag	gtcaagagat	caagaccatc	ctggccgaca	39660
cagtgaiaac	cggctctctac	taaaagtaca	aaaaaatata	tatatatata	tattattatta	39720
tattatatata	atatatatca	gagccttggg	aatccttgtg	tgctgctggg	gaaggtagtg	39780
gtgcagccac	ccttgacagc	aatctggcag	tacttgggta	tattaaatgat	aggcacacac	39840
cacgaccagg	cagtccctact	cctgggtcta	aatcccaaa	aattctcaca	caagtccata	39900
aggagacatg	tacgaggctc	attcagcatt	actgggagtg	ggaatcaaac	tgggtgtcca	39960
tcacaggag	acgagatgga	caaaatgttg	tggatatlaa	gaccagaaac	accaaglaac	40020
agagatgggt	ggtgagtgac	aatcctaaga	tacagaataa	aggctagaac	atgatgccat	40080
tcattgtaaat	taaaaaataga	tgccacaaaa	gcagtatagc	cgtgacccct	gaatagcaca	40140
gggtttgaact	gcctgtgtcc	acttacatgt	ggattttctt	ccactctctg	taccccaag	40200
acagcaagac	caaccctct	tcttctctct	cccccctcagc	ctactcaaca	tgaagatgac	40260

-continued

aaggatgaag	acttttatga	taatccaatt	ccaaggaact	aatgaaaagt	atattttctc	40320
ttccttatga	ttttctttat	ctctagctta	cattattcta	agaataggt	acataataca	40380
catcacacgc	aaaaataatg	ttaattgact	gtttatatata	tgggtaaggc	ttccactcaa	40440
cagtaggctg	tacgtagtta	agttttggga	gtcaaaaagt	atacacagat	tttcaactgt	40500
gcaggcaatc	agttccocig	acccocctcat	tgttcacggg	tcaactgtat	atacacaaaa	40560
gtatttatatg	aacctcatta	gaatagctgt	ctataggagg	aagagaatga	gagtgaggata	40620
aaecggaatg	aacaaataaa	ccaaacaatg	cattascaag	caaaacaaca	gaggggcttg	40680
catggggcag	tgtgtataaa	gggctaagaa	tgaagaatata	attaattcaa	ttcctcacac	40740
ctgagggtcta	aaaccaagga	aaggaggagg	caggcggtgga	ggtcaccgcc	tgtaatccca	40800
gcactttggg	aggctgaggg	gggoggatca	caagattagg	agtttgagat	cagcctgggc	40860
aacacagtga	aagcccatct	ctacaaaaaa	tacaagaatt	acccagggtg	ggtggcacat	40920
gcctgtagt	agctactctg	gaggctgagg	caggagaatc	acttgaaccc	aggaggcgga	40980
ggttgacagg	agccagagac	acacccatgc	actccagcct	gggtgacaga	glaagactct	41040
gtctcaaaaa	aataaaaaaa	ataaaaaaac	agagaaaggg	aggaaactag	atccaggctg	41100
actagataca	gccttttagag	ttagaaaaa	tgattttgaca	atctaaagcc	acactcagat	41160
tgaatgaaat	tgaaaaagcct	ttcaaaactaa	aacatttaaat	tacaccatct	gctgcagaca	41220
gaactcagac	aactcaaaaa	ggtaatgtca	gcgtgggtgt	ttatatccac	acccctcaaca	41280
cagaataaaa	alcagctgca	tgtagaagcag	tgactagaat	gaagaaaagg	ctgctctctta	41340
cttctctcta	tggtgtcttt	ccgaaaacat	taataggcac	cagctctatg	catgtcaccc	41400
tgcagggaga	catgggggat	ataactatga	cttactgttc	attcctcaag	gaattcccaa	41460
tcttgtggaa	gattatcacac	aatgaggcaa	caaaaaactat	ccaataaaac	cacggaaaag	41520
aagccagtga	caaagaagcc	agtgatgaaa	ggccctgtga	gcagagctga	tggccatttg	41580
gggaagaaag	acccaactgg	atgggggtga	tcagggtggc	tcngtgggaa	agntgggaag	41640
gaagtggcag	atctctgagc	tggatgatgg	gocactacca	tctgttatatg	gctaattaaa	41700
gacactgtgt	ggatttttta	ttcagctctt	tcgtgtcatt	ctgtctatca	gcacagaaac	41760
caactctcaac	tttccagcta	tattgagcta	aactctccac	ctcatggaa	ttgcagataa	41820
agttcaaaaag	gactccttgc	ttttcaaaat	aattttgaat	ggttgagtag	tcctctctgt	41880
ctctctcact	gacccctct	caaggctgct	gagcacgtgc	catgtctatg	ctttctccaa	41940
catcaggaaa	tgtttctccac	tcagtttccac	cttaatacaa	atgtgttctc	tcttcagaga	42000
aggcaaaaaa	attcatgacc	atctgactgg	gagaagtcac	ttctaggtaa	agtgctccatc	42060
tttttctgag	gaacacagga	ggaaaatctt	acagaaaaga	gtaaacacag	caggccctaa	42120
actgcttttt	aaaataaata	aataaataaa	taataaataa	aataaataaa	taataaataa	42180
aataaataaa	tgtatagggtc	ttctgtattg	gcacggctag	ctctcaaatc	ctggctctaa	42240
gagatccccc	cacctgggc	ccccacagtg	ttgggattat	agacatgagc	catlgtgctt	42300
ggcccaagac	tgttattctt	aaaaagtctc	ataaaaaagca	tgggtaatcc	ttggctggca	42360
ccctgggaact	tagatttccg	aagggttccc	acacatccaa	ctggaaagag	ggactcactg	42420
tgcctaaatt	attgtgtggg	ttatgtctgaa	ctcctgcttt	tcttcaggta	gcgtgggaatg	42480
tggtatgtgc	tgggcaaaag	gggctctgat	gaccagcccc	caataaaaaac	cctgggtggt	42540

-continued

gggtctctctag	tgagttttccc	tggttagacag	catttcacat	gcgttgtcac	agctccttcc	42600
tcggggaggtt	aagcacatcac	atccttgttg	actgcactgg	gagaggatgc	ttggaagcctt	42660
gtgcctgggct	tcccttggac	ttggccccc	gcacctttcc	ctttgtctgat	tgtgtctttgt	42720
atcctttcac	tgtaataaat	tacagccgtg	agtaaccac	atgctgagtc	ttccaaagtga	42780
accaccagat	ctgagcatgg	tccctggggg	ccccaacaca	gaaataaatt	ataaaagacc	42840
aaggactggg	catgggtggc	catgccggt	atctcagcgc	tttgggaggc	cgaggcagga	42900
ggccaggtta	agcccaaaag	ttcaaaagtt	cagtgacct	tgactgogcc	aatgacctct	42960
aacctgggag	acagagcaag	accctgtccc	caaaacaata	aactaaacac	atacttctgc	43020
cttccaaagt	tcttaaaatt	caatggaatg	gtagaacat	ttttaaaaca	ctaaatcaaa	43080
agaaacctgg	aaaacaagag	tgcgatggc	caactaaaat	gtctaggaaa	ttctgaaaa	43140
gtaaaaagta	ctcagaacca	gattacctga	gcaaaccata	gccaatata	agcttgggag	43200
gaggctgtta	tgcagaagga	aatggttaac	ggtttccagg	aacagacttg	taacagcaga	43260
lagaacagca	gaggtagaac	ctgacaaggt	gattacctgg	ggaactgcag	totgaatgac	43320
caggactgtt	ggacccttcc	cctcacatgg	aatcacacag	ccactcagca	gcacaccaca	43380
gccttccaac	aatcacagga	ggcacgctac	gcctagttaag	acaggaaaaa	aggaattctc	43440
aaacttcgaa	gatgaacaca	taaaagaatca	ccaagttttt	attcagtatg	atgaaacagg	43500
gacactgaat	caacagaaca	caaacccaag	caaaataat	tactagagca	catagaagaa	43560
altattagat	attcttggga	agacctlaag	ggacattata	aagagcaagc	agttgggtatg	43620
tgacgatctt	tgtgatatac	caagaaataa	aaacacagga	tgaagaccag	atagagaata	43680
atgctactat	tttgtcaaaa	aaggagaant	ggagaactctg	attcatattt	gotttgtattt	43740
gcattgaagaa	actttggaag	gtacataaagt	aactaacaac	aatggttacc	tacttgtlaag	43800
gcgagagaag	taagaggaca	ggaatggtgg	gaacaccttt	tgtgtccgga	attggtgggt	43860
tcttgggtctg	acttggagaa	tgaagccgtg	gaacctccgc	gtgagcgtaa	cagttctttaa	43920
aggcgggtgtg	tctggagttt	gttcttctctg	atgtttggat	gtgttcggag	tttcttctct	43980
ctgggtgggtt	ctgactctcg	ctgactcagg	agtgaaagctg	cagaccttcg	cggcgaggtgt	44040
tacagctctt	aagggggcgc	atctagagtt	gttctgttct	cctgggtgag	tctgtgtctc	44100
gctaagctca	ggagtgaaag	ctgcagacct	cgaggtgtgt	gttgagctc	atatagacag	44160
tgacagccca	aagagtgcgc	agtaataaga	acgcattcca	aacatcaaaa	ggacaaacct	44220
tcagcagcgc	ggaatgcgac	cgcagcacgt	taccactctt	ggctcgggca	gcctcgtttt	44280
attctcttat	ctggccacac	ccatatactg	ctgattggto	cattttacag	agagccgact	44340
gctccatttt	acagagaacc	gattggttca	tttttcagag	agctgattgg	tccattttga	44400
cagagtgctg	attggtgcgt	ttacaatccc	tgagctagac	acaggggtgt	gactggtgta	44460
tttacaaatcc	cttagctaga	cataaagggt	ctcaagttcc	caccagactc	aggagcccaag	44520
clgggttcac	ccagtggtac	cggcatcagt	gccacaggtg	gagctgcclg	ccagtcctcg	44580
gcctctgcgc	cgcactctct	agccctcttg	tggtctagtg	gactgggcgc	cgtggagcag	44640
ggggtggtgc	tgctcaggag	gctcgggcgc	cacaggagcc	caggaggtgg	gggtggctca	44700
ggcatgscgc	gccgcaggtc	atgagcgcgc	ccccgcaggg	aggcagctaa	ggccacgcga	44760
gaaactgggc	acagcagctg	ctggcccaag	tgctaagccc	ctcactgcct	ggggccgttg	44820

-continued

gggocggctg	gccggccgct	cccagtgcg	ggcccgccaa	gccacgcgc	acccgggaact	44880
caogctggcc	cgcgaagcacc	gggtacagcc	ccggtlcccg	cccgcgctc	tcctccacca	44940
ccctccctgca	cagctgaggg	agctggctcc	agccttggcc	agccacagaa	ggggctccca	45000
cagtgacgcg	gtgggtgaa	gggctcctca	agcgnggcca	gagtgggccc	taaggctgag	45060
gaggcaccca	gagcgagcga	ggactgcacg	caogctgtca	cctctcactt	tcatttatgc	45120
ctttttaata	cagctctggtt	ttgaacactg	attatcttac	ctattttttt	tttttttttt	45180
tggagtggag	tgcgtctctg	tgcgcccagc	tggagtgcag	tggtgccatc	ctggctcact	45240
gcaagctccg	cctcccggtt	tcaacacatt	ctcctgcctc	aacctcctga	gtagctggga	45300
ctacaggcaa	tgcgccacc	gccagctaa	ttttttattt	tatttttttt	ttagttagaa	45360
cggagtttca	ccatgttagc	cagatggtct	caatctctcg	acctcgtgat	ccatccgctt	45420
cggcctccca	aagtgtctgg	attacagacg	tgagccactg	cgcctcgctt	atcttacctt	45480
tttcaaaagt	taaaactttta	gaagttagaa	ccggtggcca	ggcgtggtgg	ctcagcgctg	45540
taaccocagc	actttgggag	gcgagggcgg	gggacacag	aggacaggag	atcgagatca	45600
tcctgggttaa	cacagtgaaa	cccgctcgct	actaaaaata	caaaaaatta	gcggggcgctg	45660
gtggtgggca	ccggcagtc	tgcctactgg	ggaggctgag	gcaggagaa	ggcgtgaaac	45720
tgggaggcag	agcttcagct	gagccagat	agtgccattg	cctccagcc	tggcgacacg	45780
agcgagactc	cacctcaaaa	aaaaaaaaaa	aaaatagaga	ccgganaagt	taaaaatatg	45840
ataatcaata	tttaaaaaaa	ctcaagagat	gggclaaaga	gttgacggaa	caaatctaaa	45900
tattagattg	gtgacotgca	aaacacagcc	aaggaaactc	ccagaatgca	gcccataaag	45960
ataaagagag	catttccgct	gggcacagtg	gtatggcagg	ggaattgcct	gagtcacaga	46020
gttgacagtc	acattgaacc	acacacattg	actccaggcc	tgggcaacac	agcaataact	46080
tgtctcaaaa	aaaaaaaaaa	ttaaattaaa	aaagacagaa	tatttgagag	aaaaaaatgc	46140
ttatttcaag	aaacatgaaa	gataaatcaa	gatattctaa	ttcccangta	agantaatttc	46200
cagaagcaga	aaatagaata	gaggcaagga	aacactccaa	acttctccag	tgcataagaa	46260
atgtgtatta	atcttttaga	tgaacaggac	taccacatgc	tgagcaggaa	gaacaaagaa	46320
gataccactct	taagccagtg	tggtgcccaa	gcgcagtgga	tcattgctgt	aatccacaga	46380
ctttgggagg	cagagcgagg	tggatcacct	gaggtcagga	gtttgagatc	agtcaggcca	46440
acatggtgaa	acccgtgtctg	tactaaaaat	acaaacatta	gctgggtatg	gtggtgcaca	46500
tctgtaatcc	caactacttg	ggaggctaa	gcaggagaat	caactgaaac	caggaggtgg	46560
aggttgtagt	gagccagat	catgccacac	tccagcctg	ggtgacagag	caagattcca	46620
tcocaaaaaa	aaaatccact	cctagacaaa	taatagttaa	attttagaac	accaaggaga	46680
aagaaaaaaa	attgtaaagc	ttcagagaaa	ataaacatta	actacaaaga	aacgagagtc	46740
agcgcgtg	actctctcct	agataccagc	agataaagca	atatctccaa	aattcagag	46800
gtlttaacgt	agaatccat	accacagcaa	gaataatcac	atggaaaagt	gaataaaaa	46860
acattgttta	aacatgcaag	ggttcagaaa	gtttaccatt	cacagaatcc	ctgaaaaaca	46920
aaacaaataa	tcacttaagg	actcattaag	aaaaaaatg	aaataaaagc	accaatgatg	46980
agtaataaat	cagaaaaatt	tacagtttac	ctaaataact	gtttatgcat	aatgtatgaa	47040
aacccaaaaa	tttaatatgg	gacagaatta	aaatcatgat	aagattcttt	tttgctttac	47100

-continued

tcattggagag	ttcacataaaa	cagattatct	tttaatagca	agagaaaaaa	atgttttagat	47160
algtgtgaaa	aactaagggt	accaaaacag	tgcaaatcca	tttatcatca	ggaaaaacca	47220
aatataaacc	acagtatcca	ccagaataac	taaaaggtaa	aagacagaaa	ttaccaagag	47280
ttggcaagaa	tgttgggcaa	ccacatatcc	ttctggggta	aataagttgg	tgcaaccgggt	47340
actgaaaact	gtttgctagt	atctactaaa	accgagcaca	tgacacagact	acaaccaagc	47400
agttccactc	ccagatacac	actcaacaga	aatgcacaca	ctcactcaac	aaaagacgtg	47460
tactagagtg	ttcatgtact	tactattcat	aatagtccaa	aaatgcaaac	aaacaaactgc	47520
caatcaaaagt	caaatgtata	tctatattag	ggatatatac	aetggcatac	acacagcaat	47580
gagaatgaaa	tgaaccagct	cggcacagtg	gttcatgcct	gtaatctcag	caattttgggc	47640
gggtaaggca	ggcagatcac	ttgaggtcag	aaatttgaga	ctagcctggc	caacacgggt	47700
aaaacctgtc	ccactaaaaa	acacaaaaat	tagccgggca	tagtggttgc	aggcctgtaa	47760
ttccagctac	tcggggaggct	gggttgggag	aatcgtttga	acccgaagag	cggaggtcgc	47820
agtgagcggg	gatcgtgccg	ctgcactcca	gcctggacga	tagagcaaga	ctcgtctcca	47880
aaaaaggaat	tcaaaaatat	aaaaaagat	gacaggaaat	atccgcnaaa	gatcagtaat	47940
caaaataaat	ataaatgggc	taaaagctacc	tattaaaaaa	caaaagatttc	acaccataaa	48000
ggatagctac	tatcaaaaaa	agagagagaa	taacagatgt	tagcaaggat	gtatggaaac	48060
tgaattcttc	acgcatttgt	ggtgagaata	taaaatgggt	cagcctctgc	ggaaaacact	48120
algtgtgggtc	atcaaaaaat	taaaaataga	agtactactt	gatccaacaa	tttactctct	48180
gggtatatata	caaaataaact	gaaagcaggg	tcttgaagag	atatttgtac	accatgato	48240
atggcagcat	tattcataat	agctatgatg	tggaaaccaac	ataaatatcc	tttgataaat	48300
atatggtataa	gcaaaaatgtg	gtgtatacat	tcaatggaaat	attaatttagc	aataaaaaatg	48360
aagaaaaattc	tgacacatgc	tacaacatgg	atgaaccttg	agggcattac	attaatatgaa	48420
ataagccagt	tataaaaaga	caaatactat	atgaggtact	atattagata	ctcatgcaag	48480
gtacctaaaa	taggcaaat	catagagaca	aaaagcagaa	tgggtggttc	cagggggtgc	48540
ggtaatggat	ccagagcttc	aattttgtaa	gatgaaaaaa	ttctggagat	tggttgcata	48600
acaatgtgca	cacacttaac	actgggggac	tgtaaaactta	caagtatgtaa	atggtaaaaa	48660
taaaaataat	aaataataaaa	ttttatgtta	ttttaccaca	atatttatta	aaagacaaaag	48720
attaactaat	taaacaaaaat	ccagccataaa	gctaattggta	agagtaacaa	ttaaagaaaga	48780
cacagaaaaat	tgaaaatcag	tgactagaaa	aagatattcc	atataaatgc	taacaaaaag	48840
caagtacagc	aataataaaga	gaatgaacaa	aaaaaaaaatt	aaataagatg	gtcgttttat	48900
tcccaaaaagg	tacaattcac	caagaagata	caagaattgt	gaacctttaa	gcacataaaa	48960
cagcttcana	aatacaacat	ttaaaagaaaa	atatatatata	aaacatagaaa	tagtacaaaa	49020
acccctacaa	gaatcataat	gggagtcttc	aatacaactc	tccatctcaa	cagggtcaaac	49080
agagaaaaaa	aataaglttaa	ggatgcagaa	aacctgaatt	accatcaata	aacttgagat	49140
taatatagaa	ctgtataccc	aataacttaa	gagttcaggg	aacagtcgtg	actgacagtg	49200
gactgcnaat	taantctgttc	ttaatctttg	tttttctttc	agcactgtgg	cagaatagag	49260
atcctaaaaa	ccttcacgct	acaaaacatc	tttttaaaaa	tataaaaaaa	tacaaaaata	49320
actctgaaat	caatagaaga	cacatggtga	aaccaaaatt	ctagaataca	gggagaataa	49380

-continued

aggcattttc	agatattaca	aaaacagaaa	attgatcatt	gctgaagtaa	ttcttaaga	49440
algtactlga	gggagaagaa	aaalgltcca	aagaaaagta	tcgtgalac	aagaaggaa	49500
ggaaagtga	gaatggtaa	acaggtagat	aaagctaata	aatgttgacc	tagaaaaaa	49560
caaaaacaat	agcaataatg	tctcgttggg	agggttgaag	taaaaatana	attaaggcca	49620
aatgtgaggt	aagtggaalg	aaagaattag	aagtcottgc	cttgttcaca	ggactgatta	49680
aataaatgag	ccaggttttc	cattcaaaaca	gttaaaaactt	gaacaaaata	aactcaaat	49740
aagtagaag	ataaaaaaca	gaattaatg	tcattagaaa	ataaaaato	aatagaatta	49800
atcaataaat	cctggttaat	aaaagctggg	tctttgaaag	gattaataaa	ataatcatta	49860
agcaagctcg	atcaaaaaaa	aagagaaaaag	gtacaaaaaa	aagtactgta	tcagaaagag	49920
aacatacaga	tacatacaga	tatgtaagag	tctgttttct	tacaccagaa	tactatatac	49980
aacattatgc	tagcatatat	taaatctcaa	taatgttaat	gattttctag	gaaaacagaa	50040
aattattaaat	ttactttgaa	gaacagaaaa	aactgagaaa	aataaatgat	catgaaaaaa	50100
algaaaaggt	aalaaatac	lgalattaac	tgctaataca	acaccagcag	cagccagggc	50160
agctgtcagt	caagttctgc	caaatcttag	ggaacagata	attcttctat	tcagagacat	50220
agaaaatgat	ggaaaagtttc	ccaatttaant	cagagaggac	agcctgatcc	ttgttatgaa	50280
cacagataaa	aatggggtaa	actatatgcc	aaactcagat	acaaaaaccc	taataaagat	50340
gctagcttat	tgatgtgaac	aatccaaaag	tgcattttaa	attagcccag	ggttttagag	50400
aaagaaaaac	tagcaatgig	accaccactt	algttaacaa	ttttaagagc	aaaatctaca	50460
tgatcatatc	aatgcattgt	acacaaaagc	atttgggcaa	aaaaccacac	accacacctt	50520
gactttttta	actcttagta	attaggcata	aacagaaatg	tacttaattgt	gatagaatac	50580
actcggtgaa	gatacagagg	gaatgctccc	taaaaccacag	ccaagacaa	agattcctat	50640
ttaacctcaa	tagtcaacac	tgacgcgaga	gtaattctatg	gaagacaagg	aaaaaagtaa	50700
aaacatgaga	gacatctggt	gtttaacaga	caataagatc	acctacttgg	aagaggcaaa	50760
cgaaatcaagc	gaaaaactat	taaaactgag	acaggcttta	gtatggaggc	tcagcttcag	50820
ctgtagtttg	ggatccaaaa	ttcaactcgc	ttgcttgag	agttaatcct	gcaaaagtaa	50880
ttttctgtga	ggtattagga	ttgacaagcc	tgtgtctctc	ctctctcccc	catcttcaac	50940
actgaaataa	cacggtggtt	ggaactggat	aacgaatct	tcaaaaaaca	aaaattgtcc	51000
tgaagggctg	acttgtgccc	ttactcaaaa	aacactttat	ctgtgcctg	cagctcctac	51060
agttgctggt	ggataagcct	gccaacacagc	tcggcgtaat	tcttctgcga	gagggcaagg	51120
aagagcaactt	tcacaggaaa	atttttttcc	gaactgtatg	cggcttatta	cataaaactta	51180
cgtgctggca	aatggagctc	cagcaaaaata	agatattcag	agtcacactt	ccttaggaaa	51240
aaaaaaaaaa	aaaagcaagc	acataaacact	aatttccttg	catgggcact	ggggaaggag	51300
gtcgttaactt	cagcaagccc	caggttcgcg	acccacggga	acccacggg	caccgcgcgc	51360
tgccccggg	cttccagggt	gcactgcgc	gcggcgcccc	agctgacccg	ggatgcgcag	51420
ccctagccct	tcccctgtca	cccgggcacg	gaagggggcg	gagcgggcg	gaagccgag	51480
ggaaggggt	tctcgttct	ctgcacacg	cagcaacccc	aaggacacaa	agggagggtg	51540
cgggaggtc	cagagaccca	ggagccggg	cggggcggtc	cggcgacact	gtcccactgc	51600
ggcgagggt	gggtgcgct	ccagggcgc	agctgtcggg	agccactgg	ctctcagttc	51660

-continued

cggtgctccgtg	cgacaaacct	cgggcccggg	ggggaggagg	cggccacctg	ccgtcgccac	51720
ctgcggccacc	ggtcccaccc	ctccggggccg	ggcaggacag	gccaggacgt	ccctccctggg	51780
ctggggacag	gacacgcgac	gaggggaccg	gggccccccg	ggcgaaagacg	cagcacgcct	51840
tcccaganaag	cgcgtcccg	gccccccgga	cggactgcgc	gccccccgcg	ctgcgccgac	51900
catcccttca	gaccacgcgg	ctgaggcgca	aagagccggc	cggccggcg	gctggcgcg	51960
cggctagtac	tcaccggccc	cgtctggtca	gcgcgcgcgc	aacccccagc	ggccacggct	52020
ccggggcgctc	actgatgctc	aggagagggg	cccgcgctcc	gccggcgcc	ccagccatcg	52080
ccgcacagggg	gcgagcgcca	gcgcgcgggg	gctcgctggg	agatgtagta	ccggagccgc	52140
cgcctgcgcc	gtctctcttc	agccggcggg	cggggggccc	ctctctccca	gctctcagt	52200
tctcatctcc	ctatctgctc	atcctctggt	cgcacataat	cgatgttttg	gcgtcccaag	52260
ccagatgtgg	accccatttc	cgcactctac	actggagggtt	ttctaagggt	ggtgccccga	52320
ccagcagctt	cagccctatc	tgggaacttg	agaaaatgca	gattcttcgt	cccaaccagc	52380
ctattcgggt	tttctcgcac	taaaacctatg	aaggctgggg	ccagcagtc	acattctcgc	52440
aagcccgcca	agtgattctg	aggcgccctc	cagtttgaga	gctatgctca	cggcctcacc	52500
tcgcgcccg	aaggagcccg	gtcttgcctg	tggcgctagc	cgcacacgga	caactcatcc	52560
tgcggggccc	gccccccgc	tgccacctca	ccgcccacag	ctcctccgg	gatgcagcgg	52620
aggcgccctg	aagtcggcaa	ggtcaacatc	cccctcagca	tcttccctac	cctcaccggt	52680
ccctctccag	gggtgcctca	tggccagggg	ttagaaagag	ccactgtgtt	tcttgacatg	52740
gaagtggcct	aagaccttaa	tgaaaaactgc	aggagtgaaa	tgacagaaac	tttggtcata	52800
cttgaggcgcc	tgaagctcaa	atgaggagga	aggaaaggat	ccaggagaaa	taaccaaccc	52860
tggcaagttg	tggcgccag	gtagaggggc	gagcctaggc	tagcggttct	cgaccagggc	52920
cgggtgttgc	ctctctcgcc	gcccccgcta	catttgggga	ggtctggaga	catttttgtt	52980
tgtcatgatg	cgggagttgc	tactgttgcc	taagtgggta	gacacgaggg	tgtctctcaa	53040
catctcaact	gaaggacag	actgcccac	aaggaaagat	gatccggccc	caataaagaa	53100
accctgggct	ggtcagcaac	aacccctttg	ttctgagaa	agaggaggaa	agaaataaag	53160
aagtggggtg	aagtttttgt	ttggtagagg	aaacttgaa	acattttcac	tggaaaggaa	53220
gagaggaaag	ggaggagag	gtctgtaagg	acgagcaaac	cgggtgacag	ctgatttctt	53280
catattgaag	taagtagtcc	tagttataat	aaattccata	taaaaaccga	gtttatccct	53340
gcataaaact	tgctcttttt	ttttaaatat	actgcttgat	tctgtttgct	aatattttat	53400
ttacaggctt	tgcatgtata	tgcaaaaatg	agatgggcaa	taattttctt	tttgaatgtc	53460
taatgttgtt	tggtttcaga	atcaatgtta	tgctcacatc	ataaaaaatt	tggaaaccag	53520
gcaggaggag	tgcttgaggc	cagaagtctg	agaccagtct	aggaaacaca	gtgagacccc	53580
cccatctcta	caaaaaaaan	aaagaaaaan	aaatgggca	tgtttgottt	ttccttttcc	53640
tcigaacaat	ltaaggagca	ttaaaaltat	ctatctcttg	aggittgato	atttccagtl	53700
taaaaatgtt	cctccacgac	tgatgcttct	tttggggagg	gtaaatcttt	taaggctaga	53760
aaagtttctt	ctgtggcaat	tttatatttt	acattttaaa	aattattcta	gagttaattt	53820
tgetaaagca	tgattttctt	aaaacaaatt	atcctttttt	tccagatggt	caagtgtatt	53880
tgcataaaag	tgaggaaaag	agtcttttgt	gaatctttta	acttctccca	aatatcttat	53940

-continued

tttgtgtatt	tttgcctctt	tattttgtta	acttttaaaa	gtgtattttt	ttttcaaga	54000
alcaactcll	aggtttlatgt	tttlggital	acggagccll	ttttcttcll	cttttlaaaa	54060
tattttttct	cotttatatt	ttagaagtat	tttgatctaa	cgtaatcgga	agaaggtaaa	54120
ttagaatctt	ttgttaactat	tgtgttttta	ttttctctta	ttttcttgaa	gtctgtcttt	54180
alaaatagta	ccatgttatt	tgtgcataaa	tattoatttg	tcttatatto	tigggaattt	54240
tcccacttca	tcataaaaag	accttccttg	tctcatttaa	tgtgttcaaa	ctttgccttg	54300
aatttaaott	tgtctgatat	tttaacctcc	tgotgaattt	tgtttgttac	cccaaaccaa	54360
ctttgtctgt	ttcgtctttt	ctgaacctct	tatttttaggt	aetcccttga	attagagcac	54420
taagttttgc	tttgtgatta	aatctgaaaa	tctttatctt	gcatagatg	agttgagccc	54480
tattoatgtg	acagctatat	tatgtctgtt	catagccott	tgggtccttt	tttcaacttt	54540
gcattgcata	ttttgtgttt	attgtgtttt	gtgtttcttc	tgataatttg	gaaggtttgt	54600
atttttatto	agggagttgc	cttataatca	tactccgcaa	tacacatcgt	cctoagtttc	54660
tlcagactgt	ctgttaactc	cctallctga	alaaaaatga	catigtaatt	tcctcttttt	54720
ttcttttaacc	ctttttctct	cctcacctaa	tgtaaatgat	ttttctcttc	tttagtattt	54780
gcttttttaa	tttaactacat	ttataaatat	cttttatcct	tgtattttta	atcagctttg	54840
aatgagatat	tgggattcct	agatataaaa	gatgttaatt	ataccatttc	cacgttagta	54900
ggtttataaa	atcacacatt	ctgctgtgta	accataatcc	cacgtttgtt	ttagttccac	54960
lctacagttt	aaaagattca	gaaglattat	taacagttal	tttgccatag	ttttttcccc	55020
aacocatatt	tggtgaagtt	atgatcctgc	tttagtttct	taagaataat	ttatagagca	55080
gagtgtggtg	gctcacgttt	gtaatccca	cactttggga	gacaagaggt	agaaggatcg	55140
cttgaagcca	cgacttcaag	accaccttga	gcaacatagt	gagaccttgt	ctctacaaaa	55200
aattttaaaa	tttagccaga	cgtagtggcg	tgtgcctata	gtcccagcta	ctcaggaggc	55260
tgaggcaaga	ggattgttag	agcccaaga	tttgaggctg	cagtgaacct	tgattgtlcn	55320
actgcacccc	agctctggca	agaaagttag	aacctatctc	tttaaaaaaa	caataataac	55380
ttatgaaat	tatatccctt	gagtttttca	tgtttaaaa	tattttgttg	ctttatcctg	55440
taaaagtttg	agtataaatt	cttgggttat	actttattta	ttgaagaaatg	tataagtatt	55500
gtctcttaga	attgagtggt	gctgtaatga	aaccagaagt	cagcctgggt	tatttttctt	55560
cagaaatgag	gtaatgtccg	gccggacacc	gtggctcctg	cctgtaatcc	caacaccttg	55620
ggaggccag	acaggtggat	cacgaggtca	ggagatttag	acctccttgg	ctaacatggt	55680
gaaaccccg	ctctactaaa	agtacaaaaa	gttagctggg	catggtgggt	gacgcctgta	55740
alcccagcta	ccggggaggg	tgaggcagga	gaatggcgtg	aaactggggg	gaggagcttg	55800
cagagagctg	agatcgcgcc	actgcactcc	agcctgggcg	acagagttag	actcctctct	55860
aaaaaaaaca	aaaaaaaaca	aagaagtga	gtaattggca	tgatgtctca	agaatttatct	55920
clltgtctat	gaalccaga	aalclcaactg	tlatacattt	tgggaattall	attctggggc	55980
aattatttct	gggacacaa	agattgaact	tatagattta	attttttttt	tttttttgag	56040
acagagtctc	actgcaattc	cagcttaactg	caacctctgc	ctcaagggtt	caagcaattc	56100
tcctgcctca	gctccccaag	tagctggggac	tacaggcgcg	tggcaccatg	ctgggctaatt	56160
ttttgtcttt	tttagtagaga	cagggtttca	ccatgttggc	caggctggtc	ttgaacgcct	56220

-continued

aaactcaagt gatccacctg cctcagcctc ccaaagtgtc gggattacag gcgtgagcca	56280
ccatgccacg cctcaallcc tctttctatc tggtaatttt tctgaagttg aaaacatttg	56340
ttctaatacg ttatttcagt gttctcttaa gatgtgtaaa gcacctattt cccaggtoag	56400
ccccatctt gctagtgcgc tgggtgggtt ctccaccaaga gctctggttt tctcctgctt	56460
aatctcaagt acctctgtca gctccacct gggttatgat ttggagtitt ttggtttttg	56520
ttttttgttt ttgacagagt ctactctgt caccagggtt ggagagcagt ggcataatct	56580
cagctcaatg caacctctgt ctccagggtt tgagcgatto tctgcctca gctactgag	56640
tagctgggat tacaggcgcg tgcacacaca cccggctaatt ttttgtattt ttagttaga	56700
tggggtttca ccatgttggc cagggtgggtc ttgaactcct gacctcaggt aatccacctg	56760
cctcagcctc ccaaagtgtg gagattacag gcgtgagcca ccgcgcctgg catggttttg	56820
agttttaatc tgtagtttta ataaagatag tgcttatgtt tgtgtttctt atatttcttg	56880
gtactcttgg gtaatttgta agatcccat atctacacaa gaagtccatt ttaattctt	56940
tcttcagac tgtttatttt attttatttt attttatttt tatgtttgag atggagtctc	57000
gctgtgtcac ttctggaggc tggagtgcag tggcgcgatc tcaggtcact gcaacctcag	57060
tctccgggtt tcaagcaatt cctcctgcct agcctccaga gtatgtggga ttacaggcac	57120
ctgcaccttt ttaatttttt tagagacaga gtctcgcttt gttgaccagg ctggagtgcg	57180
gtggtgcaat catggctgac tataacctcc aaactcctgg ctaagtgat cctcctgcct	57240
cagcctcctg agtagctggg actacaggca catgcaacca tgcacagtta attttaattt	57300
ttttgtagag acagggtctc catatgttgc ccaggctggc ctctactcct tggcctcaag	57360
taactcctct acctcagcct cccaattac taggattata agcatgagcc acctgacca	57420
gccttgtctt actactttaa ttcatatgt taggtgacca tgtaattgat catccaaacc	57480
aggatactgt aagaatgaaa gaggtcgaca gtatgatgat gctgggacta gcattgtgca	57540
ctgagattat ttctgggaaa gaggagata cggtaacctt acttatagtg tgcctgtctt	57600
tggattgttg aatttggagt ttctatttgc aggtctattt caactgggca gccttgatcc	57660
gcctgcacca gcaatgctac cgtctctctc accgggtctc tgggacccct tcagtcacta	57720
taacttagct agttcccaac cctcccaact cctaaaagcg taaccaggaa tctgcctca	57780
ggctactcgc cgtctctcgt gggctgttct agttcctatt acccagagtc aaactccag	57840
catccctac cgtattccag acttgagtc cagagcttta acctctcag gcccaactcc	57900
cactttgcat ttctgtccct atatcttagt ccatggagat acatttcagt tctttgagtc	57960
tacttacaaa gtaaattttg ctgtttttta attttttttt tgagatggag tcttgccctg	58020
tcaccaggc tgttggtgcaa tgaagccatc tgggtcact gcaacctcag cctcctgggt	58080
tcaagcgatt catctgcctc agcctcccaa gtatgtgtga ttacagacag gccaccacac	58140
gccagcgtaa ttttttttat ctttttagtag agacagggtt tcacctgtt ggccaggctg	58200
gtcttgcaat cctgacclog tgatctgccc atctgggcct cccaagtgc tgagattaca	58260
ggcgtgagcc actgtgcccc gccaattttg ctttttttat atttcatttg tatatgttta	58320
gaggttaagt ttacagtgtc atatgcattc ccaaatatta gacccaaaaa atctccaaa	58380
aattagaag aaaatccaaa aaatctcaaa aaatcccaaa aagcaacaat ctccagacc	58440
atactcactg accccaata aaataaaatt agaaattaac caaacttaa caaataaag	58500

-continued

tactcaagtc	agagaggaaa	gaggaaataa	acatcaaaat	tacaaagtc	aggcgtg	58560
tcacgcctgt	aalcccgaa	ctttgggagg	ccaggcgagg	cagalcacaa	ggcagggaat	58620
tcgagacag	cctggccaat	atggtgaaac	ccgttttcca	ctaaaaatac	aaaaattagc	58680
caggcatagt	gatgtgtgoc	tgtaatccag	ccacttggga	ggctgaggca	ggagaatcac	58740
tgaacccagg	gagacgaaga	tgcagtgag	ccaaaatcgt	gccactgcac	ttcgccctgg	58800
gtgacaaagc	gagactccat	ctcaaaaaaa	aaaaattac	aaactcttta	gatagaaatt	58860
ttggtgtttt	tttttgagac	ggagtctcac	tctgtcgag	aggctggagt	gcagtgggac	58920
tatgtcagct	caccgcgaac	tccatctcct	ggattcaagc	aettctcctg	tctcagcttc	58980
ccaaagtagct	aggattacag	gcgccacca	ccagaccag	ctagttttta	tatttttagt	59040
agagatggtg	tttcacaaig	tggccaggc	tgtctcaca	ctcctgacct	caagtatcc	59100
acctgtctca	gcctcccaaa	gtgctcagat	tacaggcgtg	agccaccgca	ccccacctag	59160
atagaatttt	caacatgagg	ccgggcacaa	tggtccacgc	ctgtaattctc	agcacttcag	59220
gaggctgagg	cgtgggagga	tcactlgggc	ccaggagtgc	aggaccagca	tggttgacag	59280
agacagacc	tgtctctatt	tatttgaaaa	aaaaaaaaaa	aagagagag	agaaagaaat	59340
ttcaacatga	aaagtatctc	tcaaacacct	cgagtgttg	gcnaaaagcg	actcaaaagg	59400
aaatgtatta	ctgtgtgtga	atttgcttga	aaataagaaa	gaggccgggt	gtggtggcta	59460
acacctgtaa	tcccaacact	ctgggagtc	gaatcaagtg	gatcatgagg	tcaggagatc	59520
gagaccatcc	tggttaacat	ggtgaaaccc	tgtctctact	aaaaatacaa	aaaattagct	59580
aggcgcggtg	gctcatgoot	gtaaatccag	caotttggga	ggctgaggca	ggtggatcac	59640
ctgaggtcac	gggtttgaga	ccagcctggc	ctacatgggtg	aaacctcgtc	tcttctacaa	59700
atacaaaaat	tagctggcg	tgttggtggg	tgccctgtaat	ccaagctact	cagaggctga	59760
ggcaggagaa	tcgcttgaa	cggggaggcg	gaggttgctg	tgagccgaga	tcgcaccact	59820
acactccagc	ctgggcacaa	gcctgggtga	caagtgaga	ctccatctca	aaaaatacaa	59880
aaaattagct	gggtgtgtgtg	gcctgogcct	gtagtccag	ctaccocggga	ggctgaggca	59940
gggaatgga	gtgaacctgg	gaggaggagc	ttgcagttag	ccgagatccc	accactgcac	60000
tccagcctgg	gcgacagagc	aagactcttg	tctcaaaaaa	aagaaaaaaa	aaggaaaaaa	60060
gaacctgat	aataaagaaa	ccaaatgttc	aactctcaaa	gctcggacac	tttaagaaa	60120
taattaataa	aggcagaagt	taaagggnag	atgataaagc	aatttttttt	gttgggtttt	60180
ttgagatgga	gtcttgcctc	gtcacccagg	ctggagtga	gtgatgcgat	cttggctcac	60240
tgaacctctc	gcctcccggt	ttcaagcaat	tctcctgcct	cagcctcctg	agtagctggt	60300
actacagtg	gcgcgaacct	ggccacagta	atttttgtat	ttttattaga	gaacgggttt	60360
cacctatatt	gttagctgtg	tctcaaaact	ctgatctcag	gtaactctgc	caactcggcc	60420
tctcaaatgt	ctgggattac	aggcaggcgc	caacgcgcct	ggcctaaagc	aaaattattg	60480
tlclgtgcac	aaggtcaata	aaaagagcaa	acgtttacaa	actggagcca	gcacccattc	60540
agctcagtgt	gtctggagaa	aaaacaatct	cgttcagaa	ttcatgatta	cgcagccctt	60600
tttgcctcct	aaaaatccta	ctatgttgtc	gttgaccttt	ctctctcttt	ctctctctct	60660
tgtttctctc	ccagaaaagc	tattcagaca	ttctcctctt	tctcaaaac	tccaacacct	60720
ctcctccat	ccttagcttc	agctgctgac	ctcaattcta	atcattgaga	aaccaggaga	60780

-continued

agcatttaag	agtgaacctc	cgcctcccg	cacggggcaa	accaccacac	cacagaattg	60840
tgccccaatl	ctgggloctc	tctctloacc	atggatggac	ggctccaggcl	cggagccaaa	60900
gccaggcctc	ccttgaggct	ctggatccac	caactgcagc	ttctcaggca	gggcccacgc	60960
agctccctcg	ctcccttgta	ccatcaatcc	ctccctccac	tgggtcactc	ccaaacaatc	61020
alatatttag	tgatgtttct	cccatgtggt	aaaatcactt	agcctctctc	ctccccacgc	61080
tactatccta	tttgtttctt	tccattctct	gcaaaacttc	tcaaagcatt	gtgtctatgt	61140
gctgaatcca	tttatctctt	ccggtctctt	gctgagtcct	tcccacagac	tctcaaccca	61200
gttactccat	gaattgacct	ctgcactgcc	acatccaatg	gtgaatgttc	agttcttaac	61260
ttttattcagt	ctttcagcag	catttgacct	ggcggatcac	tccctctctt	taaaaatact	61320
tttctcagcc	aggcgtagtg	gctcacacct	gtaatcccaa	cactttggga	ggccaaggcg	61380
ggaggatcat	gagagccacg	gagttcaaga	tccgctgggg	caacatggga	agaccctatc	61440
tctacaaaaa	ctaaaaagta	gccagtgtag	tggcatgcac	ctgtagtccc	atctacttag	61500
gaggctgagg	cagtaggagtg	acttgagcct	gggaatcaaa	ggcgcagtg	agccatgatt	61560
gcaccactgc	actccagcct	gagtgacagc	gagacccctg	ctcaaaaaag	cnaaataggc	61620
aaotttttct	agcatattcc	tctgattctc	ctgctgcttc	tgtctgcaac	gattcagttc	61680
cctttgcggg	ttctctctca	tctctctgat	ctcttgacct	tgaagtgcct	cagagtcacg	61740
tctttttttt	tttttttgag	acgcagtcct	gtctgtccac	caagctggag	tgcaatggcg	61800
aggctctcag	ctatgcacac	tctgcctcct	gggttcaagg	gattctctcg	ctcagcctc	61860
ccaagtatcc	aggactaacg	gcacatgcca	ccatgcccag	caaatgtttg	tatttttagt	61920
agagccaggg	ttttactata	ttggccacgc	tggctctcaa	ctcctgaact	ctggaaccac	61980
cgcctctggc	ctcccaaaat	gctgagatta	caggcatgag	ccaccacacc	cggcccacag	62040
tacagtcttt	agacggcctc	tctacctata	cttgcctccc	tcataaaact	ctcctgcctc	62100
atggctttaa	ataccatcgg	tagactgatg	actcccatat	ttctcttttt	tttttgga	62160
cggagctctg	ctcagtcctc	caggctggag	tgcagtgagg	cgtctctggc	tcactgcaag	62220
ctccacctgc	caagttcaac	ccattctcct	acctcagcct	ctccagtagc	tgggactcac	62280
ggcaccggcc	accacggcctg	gctaattttt	ttgtattttt	agttagagtg	gggtttccac	62340
atgttagcca	ggatgtctc	gatctcctga	cctcgtgctc	cgcctctc	ggcctcccaa	62400
agtgtgggga	ttatagggtg	gagccaccgt	gccagccga	tgaactccat	atttctatct	62460
cttgcgtgtg	gggagttctc	ctcagaacct	catactcata	aetccaaact	tcataaatag	62520
tatctcaaat	gggcaatatg	ctcaaaagtc	aattctact	tttctcccta	aaattgcttt	62580
oatgcagtct	ccaccatctt	aatglccaat	ctaacattag	gaggcaaaaa	ctttgaagtc	62640
attcttgact	cttctctatt	acacaccccta	tccaatcttt	ctgcagatcc	agtcgaaccc	62700
caaatccagt	tagctctcat	catctccct	gttaacccct	ggtccaggcc	atcttctct	62760
ctacactgaa	ctactgcagc	attctctca	ctggctctct	tggtctctg	ttactccac	62820
cttagcatag	tctccacaga	gcagtcagag	ggatcctttt	aaagtgtaat	tccatcctg	62880
tccctgctct	gctcaaaaac	ctgtcgtgat	tccggtttta	atctgtcaga	ttaaaagcca	62940
gagctcttcc	agtgacctac	atgatctgcc	tattatcacc	tccacttct	ttcccttg	63000
tactccact	ccagctctc	agctgtcctt	tctgtttcct	gaacagccca	gattttgctt	63060

-continued

ctttagaacc	tttgtatttg	ctgtccocct	tgtctggaat	gtttttccag	gaagtcaccc	63120
ggctctctcc	tgcacttcct	tctgaccac	calglttaaa	aatcactcaa	acacacttca	63180
ggcgggacat	ggtgggtcac	gcctgtaatc	ccagcaacttt	gggaggccaa	ggtgggtgga	63240
tcacctgagg	tcaggaggtc	gagaccagcc	tggccaacat	ggtgaaactt	cgtctctact	63300
acaaatacaa	atagtagcoa	ggtgtagtgg	cacacacctg	taatctcagc	tactcaggag	63360
gctgaggcag	gagaatcgct	tgaacccaga	aggcagagga	ggtgcagtga	gccaaagatca	63420
cgccacaaca	cccagccctg	ggtgacagag	caagacccca	tctcaaaaaa	aaaaaaagaa	63480
aaaaaaatca	cacaaacaca	cttctcttca	tattcctttt	ccaagtttta	ttttctcca	63540
gaatacttta	cattgtttta	atggaagtto	tccgtttccc	cccaactaga	atggataactt	63600
cctgcaggta	ggcactctag	tctccccatc	caagtactaa	ccaggctcaa	ccttgcttag	63660
cttctgagag	caggggagat	caggccctgtt	cagggttgga	tggcccagga	attttgattc	63720
tgtttttatto	attgtgtgtc	tgttgattct	cttttgttcc	tctctctagt	gctgagaaac	63780
clacttglac	ataataagca	ttaataaact	atttgttgaa	tgaatgactt	gttgaatgaa	63840
ttaatctcag	aaatgcagga	ctggtctctc	attagaaaat	ttttcaaggt	cattctctgt	63900
tgtcgttaaca	cattaagaga	ggaaaatttt	gtactctaaa	tcatttgata	aaatacatcc	63960
tgattttctgt	tttcaaaaac	tcttagtggc	tgggcgaggt	ggctcacatc	tataatccca	64020
gcattttggg	aggacgaggt	gggcggatca	cttgaggtca	ggagtgttag	accagcctgg	64080
ccatcatggt	gaacccctat	ctctactgaa	aatagaaaaa	ttagccgggt	gtggtggcgc	64140
atgctctgtg	tccagctctc	ctgggaggtc	gaggcagag	aatggcttga	accggggagg	64200
cggaggtgtc	agtgaagcaa	gatcatgcc	tgcactcca	gcctgggtaa	cagagtga	64260
ctccatctca	aaagaaaact	cttagtgagt	ttaggaatcc	aaggaaagacc	ctcaaacata	64320
atagataatc	tagctaccag	aagccttcag	taaaccttaa	cactccatgg	tgaacatta	64380
gaacattcc	tactaaaaga	caggctaaaga	atgcctgcaa	tcttcacggc	tagtccaaaga	64440
agtcaaaaag	aagaaatgag	cgtgtattta	aaaaataaaa	caaacaaaaa	actaccgatg	64500
cagaggctgg	cagcaaggac	tgaaggactg	taccgtactt	gcctggagca	ggcggatggc	64560
caacccccctg	cgaagccctg	tcaagctggc	gggggacgct	ccagtgtgtg	agtggcagga	64620
tgcagggtac	tctctctctc	agggaagtgc	actggggaga	tccctcccca	ctcacacttt	64680
ggcagctggg	gctttggaat	gtgacttagc	ttctgtcaaa	gggtcaatcc	accctttgat	64740
atatgatgca	aaggcgaaac	tatgatgcaa	agggtgagga	acagcccaaa	ttaggacttt	64800
taccacagct	gtggagggtg	acagcgacag	tgggtggccc	tggccagact	tttcatgctc	64860
aaagtggtg	gttgttcttc	ctaactlctg	tccctccagg	gtctccttgg	cctgtgtgct	64920
gaacctgctt	cttttaattt	tttttaactt	tttttaattt	ttaattgttt	taattaaaac	64980
aaattttgaa	aactgtctga	acctgctttt	gaacctgtct	atgatttgaa	tgtttgtccc	65040
clgcaaaact	gattttgaaa	cttaactctc	aaagtggaac	tattgagatg	gggcttttaa	65100
cagtgaactg	atcatgagag	ctctgaacct	atgagtggtt	taattggatta	atgagttgtc	65160
atgggagtg	catcagtggt	tttataagag	gaaganttaa	gacctgagct	agcatggtgc	65220
ccccctcacc	atttgatctc	ttacactgct	taggggctct	gcagagagtc	ccacccaaca	65280
agaaggctct	caccagatad	agctcctcaa	ccttgtaact	ctcagcctct	gtaactgtaa	65340

-continued

<hr/>	
gaaataaatg cttttctctt atgaattacc cagtttcaga tattctgtta taacaatatg	65400
aaaaagaacl aaggcaaacl ctcalgallc tactgocatg ccattccaal aaactcccll	65460
tatgcttaag agagccagag ttggccaggc gtggtgactc acgcctgtaa ttccagcact	65520
ttggggggcc gaggccgggtg gatcccaagg tcaggagatc gagaccatcc tggctaaacc	65580
ggtagaaaacc cgtctctact aaaaatacaa aaaaattagc tgggcgtggt agtgggtgcc	65640
tgtagtcoca gctactcggg aggcctgaagc aggaggagaa tggcgtggac ccaggaggcg	65700
gagcttgacg tgaagtogaga tcgtgcaact gcactccagc ctgggtgaca gaatgagact	65760
cgtctcaca aaaaaagaga gccagagttt attctgtgtg cttagcaacca agaaatctgg	65820
ctggtgcact gaagtttcca taataatatg caatttaaa gctctttcca agccaggcaa	65880
tgcctagcct tgtgtagtcc ttgtgtaat acattcattc attcatttgt tcaaccaact	65940
gtgctccaga gactaagaat acaaaaatgg gggccgggtg tgggtgctca cactataat	66000
ccatagcact ttgggaggcg aggcaggtag atcaactgag gtcaggagtt cgagacaaac	66060
ctggccaaaa tggtagaaaacc cctactctac taataataga aaaaattagc tgggggttgg	66120
ggcggaaccc tgtaatccca gctactcgtg agactgaggc aggagaatca cttgaacccg	66180
ggagggcagag tgtgcagtga ccgagatcg caccactgca ctccagcctg ggcaacagaa	66240
gcgaactcc accctgaaaa aaaaaaaaa aaaaaaagag ggcgggggct gggcgcggtg	66300
gctcacgcct gtaatccag cactctggga ggcgaaggca ggagaattac gaggtcagca	66360
gatcgagacc agcctgacca acatggtgaa accccatctc tactaaaaal acaaaaalta	66420
tccggcggtg gtggcgcaaca cctctagtcc cagctacttg ggaggctgag gcaggagaa	66480
cgttgtaacc cgggaggcag aggttgcaat gagccgaat catgcactg cactccagcc	66540
tgggtgacag agtgagactc cgtctcaaaa aaaaaataaa aaaaaaaaaa gaattcaaaa	66600
attgtagagt tatagtgtgc ttctagtta gttgagaggga catctgtcct tcaaggagg	66660
ctagaatcta taacctgagt ccttactgaa atcaatccag cagtcaaaac atgggacaaa	66720
cgatccagc agtaagatag gaagagcacc ttgtacatt tagctcatgt tgagataagc	66780
cactgacaga gctgaaggaa gctcacagtt ctgggttcca tcccttggca tttaaaaaga	66840
aaagtgtcaa gaaatttcgg ttggtcacgg tggctcacgc ctgtaatccc aacactttga	66900
gaggccaaag caggcagatc acgaggtcag gagttcgaaa ccagcctggc caacatggtg	66960
aaaccccgtc tctactaaaa acagaaaaat tagccgggca tgggtggcgca tgcctaat	67020
ccagctact caggaggctg aggcaggaga attgcttgaa cccgggaggg ggaaggtgca	67080
gcaggtgaga gcaggccact gcactccagc ctggggagaca gagcaagact ctgtctcaaa	67140
aaaaaaaaag aaaaaaagaa agaaaggaaa aaaaagaaag aaaaaaaga aaaaagaaaa	67200
ttcaggccag gccaggcctg gtggctcaca cctgtaatcc caacactttg ggaggctgaa	67260
gcgagacggt gccctagacc aggagtttga gaccagcctg agcaacatag cgagaccctg	67320
tcctataaaa aaaaaallll lttltggcca gagcagtggt ctacagcccg taatccagc	67380
actttgggag gccaggccag gtggatcacg aggtcaggag atggagacca tccctggcta	67440
ccagggtgaa ccccatctct actaaaaat acaaaaantt aacccggcgt ggtggcgggc	67500
gcctgtatgc ccagctactc gggaggctga ggcaggagaa tggcgtgaac ccgggaggcg	67560
gagcttcag tgagccagga ttgcgcact gcactccaga ctgggagaga gtgagactcc	67620

-continued

gtctcaaaaa	aaaaaaaaaa	aaaaaaaaat	taattgtcag	gtgtgtctggc	atgcagctgt	67680
agtccttagct	actcgggagg	ctgagglaag	aagalogctt	gagcccagga	gttcaaggct	67740
gcagtaaatag	tgcctctcac	tctaccctgg	gtgacaaatga	gacctctct	caaaaaagaaa	67800
gaaaaaagg	aangaagaan	agaagaagng	aaagagaaaga	aaggaaaggaa	gaagaagaaga	67860
aaaagaaaaag	gaagggaagga	agaagaaaaa	aaaagaaaga	aagaaaagag	agagaagttc	67920
aaagaccaaa	gggtcaggat	cccaaaaatag	tttttatgtt	ttatttattt	atttacttat	67980
ttattttttga	gacagtatgg	ctctgtogcc	caggctggag	tgcagtgatg	cgattgoggc	68040
tcactgcagc	ctccaaactg	ggctcagggtg	gcccctcccac	ctcagcctcc	cgagtagctg	68100
ggaccacagg	cgcgtgccac	catgccacgc	taattttttta	attctttgtta	gagatgagggt	68160
ctctatatgc	tgccccaggct	ggtctogagc	tctgtggctt	aagccatcca	ccgcctcggg	68220
ctccccaag	tgcctgggatt	acagaagtga	gccaccgcgc	ctaactcgggt	ggttgttttg	68280
tttattgaag	gggtctcgtct	gctgccacgg	ctggagtgcc	agtggtctgtt	cacaggtgca	68340
gtcttgagc	attgcacacg	ctcttgggct	ctagcgatcc	tccagagtag	ctgcagctgg	68400
gattccaggc	gcgcacaccg	gcggggctca	gaatgggttt	ttatattgag	ggttatgctg	68460
ccacctagag	gatatatgta	gtacccgaact	gtgtgcccgc	ggaggtcgag	gttgagtgta	68520
gccaagatga	tgccagggca	ctccagcgtg	ggtagacagag	caagatttca	tctcaaaaaa	68580
aaaaaaaaaa	aaaaaaaaaa	aagaattgaa	agtaaggtct	tgaagagata	tttgtgcctg	68640
tatggtcata	gcagatttaa	ctttgaccca	ctagctaaaa	cacaaaagca	acatgtgtct	68700
gtcagcaggt	gaaccgataa	acaaaatgtg	gtatatatgt	acaattgaat	attatctcagc	68760
ctttaaaaag	gaataaaaag	ctggatgcgg	gggctcacgc	ctgtaactct	aacacttttg	68820
gagactgagg	tgggtggatc	acccgagggt	aggagtittga	gaacagcctg	gccaacatgg	68880
tgaaaacttca	tctctactaa	aaataactaaa	attagccggg	catggtggca	cttgtctgtta	68940
atccaagcta	ctggggaggc	taagggaagga	gaattgcttg	aactcaggag	ccggagggttg	69000
cagtgagcta	agatggcacc	actgcactcc	agcctgggca	acagagtgag	actccatctc	69060
aaacaaaaca	aaacaaaaset	tattattttcc	aaagaaacaa	gacctgtgggt	ccatttcccc	69120
gcccacacct	gatgttgact	cacaaacac	agcctgggtt	gctatgagcc	tgcttcattt	69180
aatgtgcacc	ttaacttcac	atcacctca	agtcctggaa	taactctttg	ctgacctttg	69240
tgtgtctgagc	catctccatg	tgcctcaacg	tgcagtcctc	ctcactgcac	tgaagcaata	69300
gccagacgtg	gtctgactgc	agggtcatcc	ttgggtgctt	aggctgactc	gggcatagca	69360
gggtgtctctg	agacctcacc	gcataataggc	tttgccccc	ataaactcta	tataaatattc	69420
atattatgtg	gtctgggtgt	gtgtagcttt	gcactgtctt	ctcgtgacag	tgcctccaa	69480
ctctttccca	ggatttccct	ctctacctcc	tcaagtccca	ctgctctgca	aagaccaaaa	69540
gctgcagagt	cccagctccc	tctcttacac	cccacgacgc	agcctcctct	ctcaggaacc	69600
ttlaaacaga	gtctttlacl	gcagatccca	agaacagcca	cacccctctc	tccacccacc	69660
tccagacaca	cccaggtaat	tatagcacc	agggtaaacta	tgtagatgga	gtccctggaa	69720
catgtggata	gtgccccttg	ggagtatgca	aaagcaacat	tgtgggaacc	tgcagagaac	69780
agggtagcat	ccaggaatca	gagcatgggc	ctctgggagg	tagggatgtg	gccaggcagg	69840
ctgccaaaaa	ttggtagagc	aaggccacag	gatctttctg	accttccttc	caaacagagg	69900

-continued

tcctcgtact	ggtgatccct	gtgttgattg	accactccct	tcctgggggt	cgtggtctct	69960
gtcccagtlg	ccgggacttc	lglgaglgc	ctactgaggt	cclltloatg	agaagcalgc	70020
tgtccctcca	cctgctggga	gcaagagtga	caacttcaat	actataatag	cagtggcata	70080
cagagnagna	ganngatgan	gtggcaagna	anacaggctt	ccaagcagga	gttttctat	70140
aaaaacaaaa	acgtttacaa	gcaaaccttt	tataaagggc	tagatagtaa	atattttagg	70200
ctttgagagc	cacatagact	tgtttgcagg	gactcaatgt	cgtatttga	gtttgaaagc	70260
agccatcagg	gttatgtaaa	tgagtgaagt	tgattttgtt	tcagcaaaat	tttatctacc	70320
aaaacagaca	atgagtgagg	tggaattggc	ccatgatcct	tagtttgcca	actcctgctt	70380
tgggtccacc	cagatctgat	tttgaattct	ggctctgcta	ctggtttagct	gcaggagctt	70440
ggaaggctct	ctgagcctgt	ttcctcatct	gtaaaattaa	agcaataatt	tctaaccctc	70500
aagagtgtta	cctcacgcct	gtaatcccag	cactttggag	gctgaggcag	gcggatcacc	70560
tgaggtcaga	agttcaagac	cagcgtggcc	aacgtggcaa	aaccctgtct	ctactaaaaa	70620
ataaaaaaag	tagccgggca	lgttgccgcg	catctglaat	ccaagclact	tgggaggctg	70680
agggcaggat	actgctagaa	cctgggaggt	ggagcgtgca	gtgagtgga	atcacacctc	70740
cacactccag	cctggccgac	agagcggagc	tcactctcaa	aaaaaaaaaa	aaaaagagtg	70800
ttagaagggt	ttgagataat	gaataaaaaga	tgccctgtgt	atactaagta	ttcaacacct	70860
gatagctgca	ttggtctaata	tataacagtt	tagaagcgat	tgagtcnaca	aatgctggat	70920
ttglcaggga	ggacttcccta	tcaggaggta	gatcttgggc	tgaglcclga	agcaaaagata	70980
ggcattggat	agaggagttg	agagaacacc	ctaggactgt	tattattatt	attcgacacg	71040
gagtcctctg	ctctgtccacc	caggctggag	tgccagtggcg	cgatctcggc	tcactgcacc	71100
ctctgctccc	caggttcaag	cgatctccct	gcctcctaag	tagctgagac	tacagggtgtg	71160
tgccaccaca	cccggtcaat	ttttatatatt	ttagtagaga	cagagtttca	ccatgttggc	71220
catgtcggtc	tcgaactcct	gaacttcagg	gatccncccg	cctcagcctc	ccaaggtgct	71280
ggaataacag	atgtgagcca	ccgcacccag	ccagaaacca	tttttcaato	cttggtcctg	71340
ccctttatta	gctgcagagt	ctcaggccaat	ttattttaacc	tcctccaaaga	ctcattttct	71400
catccacaaa	atgaggcaaa	taataatctc	tcactatccc	ggttgctcatg	agaattaaat	71460
gcaacatgac	atttaattgaa	atgagaagtc	ccttggaacat	taactggcta	aagtatgtgc	71520
tcgacaaagg	tatcatttta	ggtggatact	tagcatctca	gaactgatgc	tcacaatgga	71580
atatcattga	aacgcattaa	aattcatttt	aaatgattgt	aggtagtga	gcaattgaaa	71640
gaagaagaca	agaggactga	ttataatgct	tcagggtcac	tagtctcctt	ttaggaggga	71700
aaaaaattt	caaglttaaa	tttaggcctc	agatttttac	ccctgctgct	cattagaato	71760
acccagattg	atgaaatcag	agcccatctg	aggctgtgtt	tttcatctcc	agaatgagag	71820
ctgttgtggg	gatttaagt	ttgaaaaagt	acatctaaaca	ggtgatcgaa	aatgatagtg	71880
atattatlgc	agtgatggtc	atlattgltg	ttatlatlat	actgaaagag	gcttcagltt	71940
tcgtatccat	aaagtgaagg	aattgcatga	gaccattgct	aagattcctt	ctagctctgt	72000
ttttttgttt	ttgtttttta	gacagagtct	ctgtcgccca	ggctggagtg	caatggcatg	72060
atcttggtcc	actgcacact	ccgcctcccg	ggttcaaatg	atcctcctgt	ctcagcctcc	72120
gaagttagctg	ggactacagg	cacacaccac	catgcaccag	taacttttat	atttttaata	72180

-continued

gaggtaggggt	ttcaccatat	tggtcagggt	ggtctcaaac	tcctgacctc	aggtagatcca	72240
cccgctctgg	cctcccaaca	tgctgggatt	acaggcoatga	gccactgtgc	ccaacccctt	72300
ctagctttct	tgatcactga	ttctagggtt	ctctgctga	atatatttga	gacatcctgg	72360
ataaagatc	atgcaagagc	tcccaatatg	gtattanta	ttgattctgg	aggcttagct	72420
actcctgatg	gattagacat	gactcaactg	cctcttatt	gtgtacaaca	caacaacaca	72480
accaagaag	gttattctgg	cattccattt	attcagttta	tttacagccc	ttacttccag	72540
cagcaagtta	aagatatggc	cagggcgggg	tgcatgtgct	caagtctgta	atcccgagc	72600
tttggggagg	caagggtggg	ggatcacaag	gtcaggagtt	tgagaatctg	gcaattcttc	72660
agacttagaa	gcaaccagct	cgataacaca	gtcttgtgtg	ggtctctcct	ctgtccctcc	72720
ctcgcttccc	tcatttttca	tccctgcccc	tgagactgtg	caccttcaca	tagccctgcc	72780
atgagacctt	catctcaggc	tttgctttct	gggtaactg	aggctaaca	ctgagtgggc	72840
ctaaaagagg	attgggattt	ggaagttaga	tatttcacca	gagaacagac	tttgctgatg	72900
atcaggccca	ggttgttaatt	gttgaaaaaa	agagaggatg	catagtotta	tctcatctcc	72960
tagtcaaaat	caacaccatg	ataaataaga	gtcaaatcct	gagatgtgaa	ttggggacat	73020
ttgagtgttt	aacctcgaga	agcttgcacc	ttcagacccc	tcacataccc	tgctccccc	73080
agaaggctgg	acattgacct	cagcacaggc	aggagccctg	caagatgcca	tttgtcctac	73140
taaagatgga	ccccctcact	ctgtttctag	gtaaataacc	aaagtcaagt	ctccacacag	73200
cctgagcaag	aaagtacag	cctgctacag	gagaaaaaac	cacactggcc	aaaggattca	73260
ctagccctgg	ccactgtgtg	tgggagggaac	cagggaatca	tgtgtggggag	tcaattgtta	73320
agctgttggg	ctgggggtgg	ggtggaatat	aagcctggcc	ctggggagtt	tttcccggtt	73380
gagggccctt	accacacaact	caagatccag	tgctatagca	ggagatccca	gagctagtcc	73440
taacagatgg	tcaggattga	acttggccta	gagtaaaatg	aggaggatag	tgccagaaat	73500
ttctcaacat	actattgagg	aagaggtcag	aaggcttaag	gaggtagtgt	aantggaaag	73560
gggtcctgat	ccagaaccca	ggagagggtt	cttggacctt	gcataagaaa	gagttcgaga	73620
cgagtcaccc	cagtaaaagt	aaagcaattt	tattaaagaa	gaacacagaa	aatggctact	73680
ccatagagcc	gagacatggg	ctgttcaact	gagtgttctt	atgattattt	cttgatttca	73740
tgctaaaaaa	aggggtggatt	atttgtgagg	tttccaggaa	aggggcaggg	atttccaga	73800
actgatggat	ccccccactt	ttagaccata	tagagttaact	tcctgacggt	gcaatggcgt	73860
ttgtaaactg	tcattggccct	ggagggaatg	tcttttagca	tgtaaatgta	ttataatgtg	73920
tataatgagc	agtgaggacg	gccagaggtc	gctttcatca	ccatcttggt	tttggtgggt	73980
tttggcggcg	ttttttatca	catcctgttt	tatgagcagg	gtctttatga	cttataacct	74040
ctcctgcaga	cctcctatct	cctcctgtga	ctaagaatgc	agcctagcag	gtctcagcct	74100
catttttaca	tggagtgcct	ctgattccaa	tgcccttgac	agcaggaaatg	ttggaaattga	74160
attactatgc	aagaccctgag	aagccattgg	aggacacagc	cttcattagg	acactggcat	74220
ctgtgacagg	ctgggtgtgtg	gtaattgtct	gttggccagt	gtggactgtg	ggagatgcta	74280
ctactgtta	atattgaca	gtttctcttc	aaacaggctg	atccgcttct	tattctctaa	74340
ttccaagtac	cacccccccg	ctttctcttc	cttttctctc	tttctgattt	tactacatgc	74400
ccaggcatgc	tacggcccca	gtccacattc	ctttccttat	ttaaaaatgg	actggggctg	74460

-continued

ggcgcggttg	ctcatgcctg	taatcccagc	actttgggag	gcgagggcgg	gcggatcatg	74520
aggllcaggag	atcgagagca	lcclggtclaa	cacgggtgaaa	cccgtctct	actaaaaatg	74580
caaaaaacatt	agccaggcgt	ggttgccaggt	gcctgcagtc	ccagcggcto	aggaggctga	74640
ggcaggagaa	tggcgtgaac	ctgggagggt	gaggttgcaa	tgagccgaga	ttgtgccact	74700
gcactccagc	ctgggtgaca	gagcagagct	cogtctcaaa	aaaaaaaaaa	aaaaaaaaaa	74760
tagctgggca	tggtggcgcg	tgccgtgaat	accagctact	ctggaggctg	aggcaagaga	74820
atgccttgaa	ccagtagggc	ggaagttgca	gtgagccgag	atcctgacac	tgcactccag	74880
cctgggtgaca	gagtgagact	ctgtctcaaaa	aaaaaaaaaa	agaaaaaaa	agacagcaag	74940
aaagagcaca	gacagagtc	caggtatttg	cagtaggaag	ctgtcagggt	agagtgcacg	75000
gaaatagaaa	gtatatttta	cacttaacagc	acatcttcgt	ttgattagcc	acatttaaaa	75060
tactgaatag	caacgtgtgg	ctatttagta	ttcactaaaa	tcttggacag	tgcaagctca	75120
aagaatcctt	gatccgtccg	gcctggtggc	tcacgccttt	aatcccaagc	ctttggggag	75180
ccaagglgga	aggalaactt	aaggtcagga	gttcgagacc	agcctggcca	acatgggtgaa	75240
acctcgtctc	tactaataat	acnaaaaaaa	ttagccgggc	atggctggtg	atgcctgtaa	75300
tcacaggta	ttggggggct	gaggcaggag	aatagcttga	atccaggagg	cgtgcagtg	75360
agccagagac	atgccatgcc	actactgcac	tcacgcctgg	gcaacagagt	gagactgtct	75420
caaaaaaaa	aaaaaaattg	ttgggcgtgg	tggtccacgc	ctgtaatccc	agcacttttg	75480
gaggcglagg	ggggglggtc	acclgggttc	tggaagtllga	gaccagcctg	gcaaacatgg	75540
tgcaacccca	tctctactaa	aaatacaaaa	attagctggg	cgtgggtggg	ggcaacctga	75600
atctcagcta	ctcaggaggc	tgaggcagga	gaatttcttg	aaccacggag	gcagaggttg	75660
cagtgagcca	agatccggcc	tctgcactcc	atcctgggtg	gcagagcaag	actatgtctc	75720
aaaaaaaaaa	aaaaaaaaac	ttgattgtct	ggacattctg	cagaacatca	tatggagaca	75780
ctatgttgac	gacatcatgc	tgaattgaag	caagaatagg	caagtgttcc	agaaacacag	75840
tcagagacac	tacatgccag	aaggtgagat	ataaacctca	ctaagattca	gtggcctgcc	75900
acactgttga	catttttaaa	cctgcctgat	gtttgtgtag	aaaaggattt	aaccttgccc	75960
aaaggggggt	ctggcccttg	tcocacgcta	ctggacataa	tctctttaaa	ctcttgaaat	76020
atcattcctg	atagaaatat	ttttgttttg	actagggggc	ttggggccagc	cagatagcaa	76080
caatgtgac	tggtgtgggg	gctttggatc	aggtggcctc	agtgtgacct	cctgagtggc	76140
tagagactag	aatcaaccac	atgggcagac	aaccacgctt	acatgatgga	attccaataa	76200
agactttgga	cacaagggtc	tggtgaagct	ttcctggttg	gcaatgctct	atactgggaa	76260
accattctg	actccatagg	gagaggacaa	ctggatatlc	tcatttggta	ctccctgggg	76320
ctttgcccta	tgcatatttc	cctgtcttga	ttattattat	tattatgaga	tggaactctg	76380
ctctgtcaac	caggctggag	tgcaatggaa	tgatctcaac	tcactgcac	ctctgctccc	76440
cggllcaag	cgatlttcc	gtclogggct	cccgagtagc	tggaactaca	gatgcatacc	76500
accacaccgc	gctaattttt	ttgtattttt	agtagagacg	gggtttccag	ttagccagga	76560
tggtctcgat	ctctctgact	catgttcctg	ctgcctcggc	ctctcaaaag	gctagggaata	76620
catgtgtgag	ccacccggcc	cagcccccct	ggctgattat	taaagtgtat	ccttgagctg	76680
tagtaaatca	taaccgtgaa	tataacagct	tttagtgagt	tttgtgagca	cttctagcaa	76740

-continued

attatcaaac	ctaaggetag	ccttggggac	ccttgaactt	gcagttgggt	tcagaataa	76800
gggtgtctca	gtgtgtlaca	tgcctctata	tttgttagtt	aattaaactll	cacaactlta	76860
ttattaccgc	ttacaactca	tgtttattca	catttatcca	cataccactt	attctagtgc	76920
cttgcatcaa	agactttcta	tctcatgtac	tttatctctg	ttgaagtata	tcctttaggga	76980
tattcttttt	ttttttltaa	ctttgcacat	acatactttt	attttttatt	tatttttaaa	77040
tttgttattt	tttgtgggtac	gtagtagata	tatgtattta	tggagtacat	gagatgtttt	77100
gatacaggca	tgcactgtga	aataagcaca	tcatggagaa	tggggtatcc	atctctctca	77160
gcaatttata	cttcaagtta	caaaccaatcc	aattacactc	tttaagttaa	tttaaaatgt	77220
acattttaatt	ttgtattgac	tagagtoact	ctgttctgct	atcaaatata	attttttttt	77280
tttttgagac	agagtctcac	tcagttggcc	agactgaaag	tgcagttggca	caagctoggc	77340
tcacttcaat	ctctgcctcc	ctggttcaag	cgaactctct	gcctcagcct	cccacataga	77400
tgggattaca	ggcacacacc	accatgacca	gctaattttt	atatattttt	agtagagagc	77460
tggtttcgcc	atgtttggca	ggctggctct	gaactccttg	cctcaaatga	tctgacaccc	77520
tcagctctcc	aaagtgttag	gattacaggc	atgagccacc	acacctggcc	aaaatagaat	77580
attctttagt	gaggtctgct	ggtgacaatt	ttttttcttt	ttttgagact	gagctctgct	77640
gttgtcagct	tgggctggag	tgcaatagca	cgatctcagc	tcactgcaac	ctccacctcc	77700
cggattccag	caattctcct	gcctcagcct	cccagtagc	tgagagatta	caggcaccca	77760
ccaccacacg	cggctaattt	ttgtallttt	aglagaaatg	ggggttcacc	gtgttggcca	77820
ggctggtctc	gaactcttga	cctcaggtga	tccacccacc	ttggcctccc	aaagtgtctg	77880
gattccacag	atgagccacc	acgcacagcc	aattttttcc	gtttttgtct	gaattcttat	77940
tttgtgtcat	ctttgaataa	tatttttgat	ggatataaaa	ttgttggttg	atagtattta	78000
tcattattat	tattattttg	agacagggtc	tcactctgtt	gcctatgctg	gggtgtagta	78060
atgtgatctc	ggttcactgc	agacttganc	tccatagggt	caggtgatct	tccacacctc	78120
gcctccctag	tagctgggac	tacagatgca	tgcacacata	cccactaat	ttttctattt	78180
ttttagagag	tgagggtttg	ccacatttcc	caggctggto	tctaaactct	gagctctaga	78240
aatccaccca	cattggcctt	acaaagtctt	gggcaatgac	tgcacagcag	ttacttttta	78300
tagcatattg	aattattaat	atgaattctt	tggcatccac	tgtaaactgt	taaaaaatca	78360
gctgtttact	tggcactctt	tttttttttt	tttttttttg	gacagagtct	tgcctctgtc	78420
ccaggcttgg	agtgcaagtg	cgtgatcttg	gctcactgca	agctctgcct	ccggggttca	78480
cgcattcttc	ctgcctcagc	ctccggagta	gctgggacta	aaggcgcccg	ccaccacgcc	78540
cggttgattt	ttttglattt	ttcglagagt	tggggittca	cogigttagc	caggatggtc	78600
tcatctctct	gactctgtga	tctgtcagcc	tgggcctccc	aaagtgtctg	gattataggg	78660
gtgagcaacc	gcgcacagcc	tctttttttt	tttttttttag	caggagtctt	actctgtcat	78720
claggttgtt	gtacaglggc	gtgalclcag	ctcagtgcaa	cctccacctc	ctgcctcagc	78780
ctgcacaaata	gctgggatta	caggtggcta	ccatcacgcc	cggctaattt	ttgtattttc	78840
agtagagatg	gggtttccac	atgttagaca	ggctggtctc	gaactcctgg	cctcaagtga	78900
tctgcctgcc	ccagcctccc	aaagattaca	ggcatgagcc	accgcacccg	gccaaagtag	78960
actcctttga	aggttaactg	cttccctcac	ccttagcaat	ttttaacaat	ttttcttcat	79020

-continued

ttttattttcc	tgaagttttg	ttattaataa	tctgtgtgca	gattttctttg	tattttctttt	79080
gltltgcagtl	calagtgall	cttgaalltag	tglgtlgtgt	tcgtglatca	ccacaggaaa	79140
attgtgcagcc	gttagctttt	caaatatttc	cttgctaaat	tctctcttct	ccctcttcgg	79200
tacanttgat	ttgattaaaa	ctaaaaaccag	ggcggggtgc	agtgactcat	gcctgtaatc	79260
ccaacacttt	gagaggctga	ggcagggtga	tcacctaaagc	tcaggagttc	aagaccagcc	79320
tggccaatat	ggtgaaaccc	cgtctctact	aaaaatacaa	aaattaccag	gcattggtggc	79380
acccatttgt	agtcaggagg	ctgaggcagg	agaattgctt	gaatccagga	ggtggagggt	79440
gcagtgagct	gagatccac	cactgcagtc	tggcctgggc	gacagagtga	gatgagaatc	79500
tgtctcgaaa	aaaaaagtta	tgaatgtttg	ataaactata	tttgttagaa	tgtttgttgt	79560
agaatactat	tcattgtatt	ttaaaccaatg	ttagattaaa	ccattcactg	gatttgtgat	79620
aattaactta	ctgattttac	ctcactgatt	tgttgttaatt	aatacaactg	gtataaaaag	79680
actgtgcaga	ggcggggcat	ggtggctccc	gactataatc	ccaggacttt	ggggaggctga	79740
ggcaggcggga	tcactcgagg	tcaggagttc	aagaccagcc	tgaccaacat	ggtgaaaccc	79800
catctttact	aaaaatacaa	aattagccgg	tcgtggtggt	gcattgcctgt	aatcccgagt	79860
cttcggggagg	ctgtggcagg	agaatnactt	gaacccggga	ggtggagggt	gcagtgagcc	79920
gatatcgccg	cattgcactc	cagcctgggc	aacaagagcg	aaactccgtc	taaaaaaaaa	79980
aaagaaaaaa	aacacataaa	acaaaacaac	actgtgacgg	ttcccaaaaa	ttaggagcat	80040
aallaaagga	actcctgata	aaaattaaat	ttatctllaca	tglaaactaa	aatgacttta	80100
tgaagttaat	tcagaaatac	aatgcagggt	attagtttgc	ccagctggcg	tattcagcct	80160
aatgtaatat	tcttgttatt	tttaaatctc	tcttttaact	ttaactatat	gtggatcctc	80220
aaatttcaaa	agattaaatg	acaatactct	tagcagcaag	cttcctctaag	catataaaca	80280
ttttaatggg	tgatgatcca	gaagggtacc	gaagaatatg	tactgccaga	tatcattcac	80340
cccatataac	ctgcgcgaca	gacatcccat	tttggggacc	tggataaatg	tgtgggttga	80400
gagaaagata	ggagaaagtg	gtataagcaa	atggcctttg	agtctgattg	acagcgattg	80460
aaetctctgc	tctactctct	aacagcctca	tgtactctac	taagttaccc	cgatctctag	80520
ggccacatct	gttaatttgg	ggttgcgatg	gcagcactct	ccacgggtct	cttttcgggg	80580
aagggcagga	attatgtatt	aagtgcagta	gttaattgtaa	agcacttaat	acaagagagg	80640
cgcataataa	gtacttcata	aataatgacg	gccatttatca	tgaatgaggt	gtatgcagct	80700
gtcggggatt	accggcagctt	cagaatttct	ggtgggcagg	gctcaaagcc	agcaaatcac	80760
actggaagtc	gaggtgaggc	actgcttctg	ccacagactgc	ttagctggag	agaatgagga	80820
aggcttagag	gagatttaga	ggaacttaga	gtccctccgc	tcnaactctg	tgggatctgc	80880
tcocgtgcoc	gagacattca	ggggatttct	cgcactctcc	cctccctcac	gtccctcccg	80940
cccatcccaa	ctaacccacac	aacacataca	aaatagcccc	tgcagaggtc	tgcacgctgg	81000
aagggaacag	gagaaaggcg	ctgcgccttc	ttgcctgctc	cctgtacttg	ggcccccgtg	81060
agacacagcc	acttgtctcc	tcagcctgca	gagaaatccc	acgtagaccg	cgcocgggtc	81120
cttggtctca	gccaatctcc	ctttgtgtgg	ggtgggagtc	acgatccaaag	gttttatttg	81180
ctacagacag	cgggggtgtg	tcgcaccaaga	acacagattg	gctcccgagg	gcattctcga	81240
tcocgtgttg	ggcgccgctc	agcctcccg	tgcaggcccg	gcagaggcca	ggaggaaagc	81300

-continued

gccagaccgc	gtccattcgg	cgccagctca	ctccggacgt	ccggagccctc	tgccagcgct	81360
gcctccgctcc	agtcgcgcctg	gacgcgcgtgt	ccctaaactgg	agaaaggcctt	caccttgaaa	81420
tcaggcgttc	atccctagtt	agcgtgtgac	cttgagcaggt	tgaactttatt	tttcagtgcc	81480
tagttttcca	gataccagga	ctgactccaa	ggactattac	tcatctggag	ggtttagcac	81540
agtlaccgtcg	catagtaaat	ttccatgtca	gttttgggta	cccttcctatg	acttgcaaaa	81600
atgccatgct	ctgaaacgaa	ataggcacat	ctttttttttt	tttttttttta	aggagctcttc	81660
ctctcgcccca	ggctggagtg	cagtggcgcg	atcttggctc	actgcaacct	ccacctcccg	81720
tgctcgagat	tctctgcct	cagcctcctg	attagctggg	actacaggca	tgccacgacg	81780
ccagttaat	ttttgtattt	ttagtagaga	cgggggttgc	ccatcttggc	caggctggtc	81840
taactcctga	cctcagggtga	tctgactgcc	tcagcctctc	aaagtgttgg	gattacaggg	81900
ataagccact	gcactctggc	agaaatgaaa	taagtaaatc	ttttaacctg	ctctaacaat	81960
atagtgaana	gacctatatta	ttattagagc	aggttaaggg	atttgccctat	ttcgggtttct	82020
agttatagtc	ttaaaacttg	acattcttgt	agaaagtaaa	aagtttccct	ttcaaaagttc	82080
cccttcttgt	taaaagaatac	atcataagtg	ttagaagtaa	tagttttatt	taaaagactaa	82140
ctttcttcaa	gctcccttgc	tttgtgtta	taactctttg	ttaaagcccta	tctatgttaa	82200
ctgttgagca	tgctcaccag	cacgttccag	ttcacagcct	atgccccctc	cttatattgga	82260
aatgtttattg	cttccctaaa	cctttcggta	agcaacttcc	tctcctctct	cgttcttctct	82320
tgcaacttacc	tatttagaaa	gtttlaggct	attagcaaal	cggctatcag	tttaagagtg	82380
tgaggtcccg	ctccagccaa	tgagtgacag	acatagcagt	gaggacgacc	caaatgcgtta	82440
agggtataaat	atgtttgctt	ttcctttgtt	caggtgtgct	ctcgacatcg	ttccatctgc	82500
gatttgacac	cctttctgca	gaaagttaaag	attgccttgc	tggagatcct	ttgtctcctg	82560
gtcgactttt	cttcgttgca	cagattatct	atttcttaaca	attttgggat	ttctaaccatt	82620
ctgaacaatc	ttgggctagt	tgtctcttct	gggcatgttt	cccatccgt	cactatgata	82680
acttcattgg	tttaaaaaac	ccagcgaaaca	tttatttgagt	tactattacc	ttcctgcccct	82740
ccccaacccc	aacccagagg	agcagttaca	acctcagccg	ctgagcgacc	tcgcccgggtg	82800
ttlaagaagca	ccnaagacag	ggaggcttga	ttgatcttgc	tttggggagta	gagggtcaga	82860
agattcacag	gaaaatggca	tttgaccaag	gatgattcac	tggagctagc	ttttaaatca	82920
tgccgaggct	tttatgttgc	agtcctctac	aaagttagac	attcgcaggg	actgcactcc	82980
gaaataagcc	cgtctccct	tttcattcgc	taatgatcca	gggagctgct	ggttccgcct	83040
ggcgaggtt	gtgccttttc	ctaatacagg	ttctgcacgc	cctcgaaacc	gcaggccgctg	83100
gccccgtctc	ctgaggaagc	agggactggg	gtgcagggtg	aagctgctcg	tgccggccag	83160
cgcctgtgag	caaaaactcaa	acggagagag	aggaggggtc	gagctggagc	gtggcagggt	83220
tgccctctgc	ttttagaggg	gcacaatttg	aagggtacc	aggggcccga	agccggggga	83280
claaggcccg	ccccglcca	gctgclggga	gggcctcccg	cccaggagat	tagtttttga	83340
gagactgggt	ctgcagcgct	ccaccggggg	ccggcgacag	acgcacaaaa	acagctgcag	83400
gaacggttgc	tcgctccagg	caccacgggc	ccgggaagga	ggcgcggtta	gcacgcgcgg	83460
gtcacgtggg	cgatgcgggc	gtgcgccct	gcaccgcgg	gagggggatg	gggaaaagg	83520
gcggggcccg	cgttgtacct	ccgtgaagc	ctagcgcggg	gaaggaccgg	aactccgggc	83580

-continued

<hr/>	
ggcgcgcttg ttgataatat ggcggctgga gctgcctggg catcccgagg aggcggtggg	83640
gcccactccc ggaagaaggg gcccttttcg cgcagtgca ggggcccctc lggaccggga	83700
agtcggggcc ggttgctgaa tagggggagc cgggcccctc ccgcgccagt ccccccgcac	83760
ccctcgtccc gaccggggcc ccgcaatgtc cttcttcctg cggaaaaggta gctgaggggg	83820
cgccggcggg gagtcaggcc gggcctcagg ggcggcggtg gggcagggtg gccgcgagg	83880
gctttcccca aggcggcagc aaggccttca gcgagcctcg acctcggcgc agatgcccc	83940
tgagtgcatt gctctgctcc gggactcttc tgggaggag aggtggcct tcttgcgga	84000
ggtcagagga gatttgctgc gctggttcag aagcgattgc taagcccat agaagttcct	84060
gcctgttttg ttaagaacag ttcttaggtg ggggttagtt tttttgtgt tctttgagg	84120
ccgtggatca agatcaagga aatctcttta gaacctatt atggaagtct gaagtttcca	84180
aatgttgagg gttttatgtc taaaagcaac acgtgaaaaa attgttttct tccaccagt	84240
ctgtcttcca atttctctt tggggggagg ggtggttact gctgttacta aataaaatt	84300
acttatgtct aaagtlcccc aacagggaaga ccaactactt tgaigacttt ggcgaagttg	84360
ctaaactactg gaaacctaac ttacaacga actacttaca tttttgattt ccagttgtat	84420
tacctgcccc atgtttacgt agaaaacgct taattttgat tctgggtaac gttgttgcc	84480
ttcattaaaa atacatatcc gaagtgagca agtatgggtc tgtggacagc agtgattttt	84540
ccgtgcaatt cctgttgctt cagataaaat gtaccagaca gaggccgggc gcggtggctc	84600
acgcctgtaa toccagcaact ttgggaggct tggcggttg atcacctgag atcgggagtt	84660
caagaccagc ctgaccaaca tggagaaacc ccgtgtctac taaaaataca aaattagcca	84720
gggtggtggc gctgctctgt aatgccagct acctgggagg ctgaagcagg agaactcgtt	84780
gaacctggga ggcggaggtt cgcgtgagcc gagatagcac cattgcactc cagccctggc	84840
aaaaagagcg aaactccgtc tcaaaaaaaa agtaccagac agaaatgggt tttgttttct	84900
ttttttgttt tgagcaggag ttctcctctt gttgcaccag ctacagtgca atggcgagat	84960
ctcagctcgc gctcaactga acctctgtct cccaggttta atcgattctc ctgcctcagc	85020
ctcccaagta gctgggatta cccatgcccc accatgcccc gctaattttt gtatttttag	85080
tagaaccggg gcttcaaat gttaggttg tcttgaaacc ctgaactcaa gtgggctcc	85140
caactcggcc tcccaaatg ccaggattac aggcattgac caccgcggcc agccagaaat	85200
gggttttgga aaagcacta aacaaaatcg aacttggttt catatgacag ctcctgctg	85260
aaactgaaca ggggcagacc agttaacct cttttctgtc ttctgtcagc tgagaattag	85320
atgattccca aaggcccat gaactctgaa tgactttaaa tactttctct taagtgggt	85380
ccgggttttg glaactgat ccagggtgat aatgcattgaa agtgcttaat gaatgaaac	85440
ggtaaanatg taggaggaag ctttatgtgt aaggcagggg tatacctaat agctctctaa	85500
tttatgtgta ttgaagtgt taacttttgt ttttttaagg ggggaaaaa ttctaagaat	85560
aalgaggcaa atgcalatl gcacaagaga ctglglctc laltcaacaa ataccttttg	85620
agtgtccaga gctgcaccag tgctgtgcta ggcctccag attgagtag gaaccagga	85680
atgtccctgc acccatggag cttatgtct actggggtag acagataata aataagcaaa	85740
caaatctctc ctctctctcc ttctgctcca tgtaagtgtg tgtgtatagg tgtatactta	85800
caagttgagt aaagtgttat gaaagattaa gaggagaaat gcaatttggt tagatgttag	85860

-continued

aggactcagc	aggtagcctt	gaacttaga	gctgaaggat	cagtaggagg	taactagaga	85920
ggccagggaa	tgcacgttc	aaaggccagg	aggcaagaaa	gagcaltggtg	cccttcaaga	85980
gaggaagaaa	ggctactgtg	actggagcat	agatgtaggc	aagtgttggg	tgattgagag	86040
ctctacgggc	cattggttagg	ttttattcct	aatgcgcaga	tgcacacat	ggtggttcct	86100
alctgtaac	ccagtatitt	aggaggccga	ggcaggaata	tagcttgaa	ccaggagttc	86160
aagaccagcc	tgagcaacat	gagacctgta	caaacattt	aaaaaattgc	tgggtatgat	86220
ggtgcacacc	tgtggtccca	gctactcagg	aggctgaggc	agaaggatca	cttgagccca	86280
ggagggtgag	gctacacatga	gccatatttg	agtcactaca	ctccagcctg	gatgacaaa	86340
tgagaccatg	tgtcaaacaa	aatacagaaa	gaatattaat	ttaaaatttt	gaaagaggag	86400
tgatctgaac	ttatatctta	aaaagatcat	tctaggggcat	ggtggctcat	gcttgtaac	86460
aagggtcttg	ggaggctgag	acaggaggat	cacctgaggc	cagttcgaga	tcaacctgta	86520
cagcatagag	agactccatc	tctacaaaa	gaaaaataa	atagctgygt	gtytgyagt	86580
attcaggagg	ctgaagcaga	aagatcaatt	gagccaggga	gtttgaggct	gcagtaagct	86640
atgatccacc	cactgcacaa	cagtgcagtc	ttgtctcaaa	aaaaaaaaaa	aatcattcta	86700
ggtgcttttt	ggaggctgga	tgtggttaaga	gtagaagctg	gagatgggtc	tgttagggat	86760
tcatctcaga	ctttaaatac	catcaatgca	ttgagtcaca	aatttaccac	actacgtttg	86820
atccttgccc	ctgaatccag	actggtatat	ccaactttag	gttcagtttg	tatctctacc	86880
tgaccaatat	agaggtgtcc	agtccttttg	cttccctagg	ccacattgga	agaagaattg	86940
tcttgagcca	cacatagagt	acactaacgc	taacaatagc	agatgagcta	aaaaaaaaac	87000
gcacaaactta	taattgttta	agaaagttta	cgaattttgtg	tggggcacat	tccagagccat	87060
cctggggccgc	gggatggaca	agcttaaatcc	agtagatacc	tccaacttac	aatatctaaa	87120
attttatgcc	agatttagtc	attttaaac	tgtcatcag	ttttctcaa	gaagtagtat	87180
tttggctttt	ttttttttct	tttttttgag	atggagtctc	gctcttatcg	ttcaagctgg	87240
agtgcagtgg	cggatcttgg	ctcactgcaa	cctccgcctc	ctgggttcaa	gtgattctcc	87300
tgcctcagcc	tgcacagtag	ctggaattac	aggcatgcgc	caccatgacc	agctaatttt	87360
tggagacagg	gtttccaccat	gttggtaagg	ctggttttgt	actcctgacc	tcagggtgac	87420
tgcctgcctc	ggctcccaaa	aggctgggat	tacaggcatg	agccacgcct	cccggtctga	87480
tttttggatt	tttagttgct	cagcccaaaa	cttttagtaca	tctttgaacc	tcttctttcc	87540
tctactctta	tatctgatcc	atcagcaaat	ctgttaggtc	tacctcacac	atatcgaaat	87600
cctaccacgt	ctcaccatct	gtgacaaata	acaccctggg	ctaggcagtc	atctctgtta	87660
agattgagtg	gttaaggatg	tctctaaagg	agatgacatt	caaatcttag	cttaaatgtc	87720
aagagggagc	tgggtttata	aagattgagg	aggcagcatt	attttgccat	aggcttccat	87780
tgggtttcca	ttccattctt	gataacttatg	gtatatattc	aaacaaaatg	cacagaaaca	87840
gacccaggla	taittgggaat	ltcggaata	gagtlccctag	ttgggaaaag	atagactgal	87900
ctgtaaatga	tgtcagttat	ccatcatctg	gcaaaaaata	atttccctgcc	tctctccta	87960
tatctcagat	caacagactt	ttctgtgtaa	gggcaaaatc	ataaatattt	taggctttcc	88020
agaccatag	gtttctgtca	cactctcctt	tatccttgaa	gccatagaca	atatgtaaa	88080
aaatgggcat	ggctgtgcta	cgataaaact	ttaattacaa	aaactggtag	tgggccagtt	88140

-continued

taggcacgtggc	cagcactttg	ggaggctaag	gcagatggat	cacttgggggt	caggagtttg	88200
agaccagcccl	ggccaacalq	gtgaacccct	gtctctacta	aaatatacaa	aaatagcttg	88260
gcattggtggg	gggtgtctat	aattccagct	actctggagg	ctaagacaca	agaatcactt	88320
gaacccagga	ggcaggggtt	gcagtgagct	gagatagcac	caactgcactc	cagccagggtt	88380
gacggagtccl	taaaacaaaa	caaaacaaaa	ggtagtgggt	tgtatttggc	ccatggggctg	88440
tagtttgcca	atccctgatg	cagaacacaa	ttccaggtaa	ataagagcct	ggaatgttaa	88500
aaaaacaaaa	cttgaaagtoa	tgtagaagaa	caggtagggg	gaacaatcct	gatctcagga	88560
taggaaggga	tattgtctaa	aataagacac	aggaaaaatat	aetccatgtt	gtgtaaattt	88620
gaactagtta	aaacttaaaa	ctttcgccaa	gcgcgggtggc	tcacgcctgt	aataccagta	88680
ctttggggagg	cagaggtgag	cagatcacca	ggtcaggaga	ttgagaccat	cctgggctaac	88740
acsgtgaac	cccgctctta	ctaaaaatc	aaaacattag	cggggcgctgg	tggcgggcgcc	88800
ctgtagtccc	agctactttg	gaggtcgagg	caggagaatg	gcttgaaccc	gggaggcgaa	88860
gcctgcagtg	agctgagatc	gcgcacactg	actccagcct	ggggacagaga	gtgagattcc	88920
gtctcaaaaa	aacaaaaaca	aacaaagcaa	aaaacotaaa	actttcctac	aataaagtat	88980
acctaagata	ctttcagaag	agaagattta	cattccaggac	gtgtatggaa	ttctctcagg	89040
taataagtaa	aagacaaggg	acatgaagag	gcagttcaca	aaagagggaag	ccaaaaatgac	89100
caataaacat	gaagagatgt	ttaacctcaa	aggaacacag	gaatgaatt	aaaaacatca	89160
aalgcacatt	caaaactagt	aagttggcaa	aallaaaaat	accaaggatg	agaatatgaa	89220
gcattgctat	atgagtgcat	ggaatggtag	agtcactttc	attaaaaatg	cacataattt	89280
gttttttatt	tatttttttg	agacagtcta	gtctgcccag	gctagaatgc	agtggtcatga	89340
ctctggctca	ccacaactct	tgccctcctg	gttcaagcaa	ttctctctgc	tcagcctcct	89400
gagtagctgg	gattacaggc	acatgccaca	acgcocgggt	aagttttgta	tttttagtag	89460
agccagggtt	ttgccatgtt	ggccaggctg	gtctagaaat	cctgacctca	ggtgagctgc	89520
ttcccaaaag	gctggggatta	gaggcgtgag	ccaatgctcc	tggtgaaaa	aaatgcacat	89580
aatttggtac	ctagcaattc	catgtctaga	ggcttatcct	agagaaattc	ttgcttatat	89640
taaaagtaaat	gttcattaac	aggaaaatga	gtaaaggtag	atttataaaa	caattaagta	89700
gctaaaaatga	ataaacatga	gctgcgtgaa	tgaactagaa	ctgggttcaat	agtcattgtca	89820
gattatttgaa	tgaatacagg	tcagatatgt	atagagtgtc	atttggtgaa	ttaatttttt	89880
tttttttttt	gagatggagt	ctcactctgt	tgcccaggct	ggagtgcagt	ggcgtgatct	89940
cagctcactg	caacccccac	ctcctgggtt	aaagtgatcc	tcctgctcca	gctccccag	90000
tagttgggat	tacaggcatg	caccacccatg	cccagctcat	tttccctatt	ttagtggcca	90060
caggggtttca	ccatgtttggc	caggctgggtc	ttgaaactcc	gaaccccaagt	gttccaccca	90120
acttggccctc	ccaaagtgct	aggattacag	gcglgagcca	ccgtgctcag	ccattttgcgl	90180
gatttttttaa	gatgtgcaga	ataatgccat	taaaaaaaat	acacatacat	gtatatatat	90240
acccggttttg	ctgggtgtgg	tggtctacac	ctgtantccc	agcaactttg	gaggctgagg	90300
caggaggatc	acttgagccc	aggtgtacaa	gactagccctg	ggcgagatag	caagacccca	90360
ctccaaacac	agaaaggata	attaggtatg	gtggcatgag	aggatcactt	gagcccaagg	90420

-continued

<hr/>	
gttcagtagt	tatcaggcca
ctgcactcta	gcctggacaa
caaagcaaga	csgtgtctca
90480	
aaaaataaaa	aataaaaaagl
attlgtatgl	ggltatagtc
aaaaaacgta	catggaaagga
90540	
aaatgtcttt	atttatttat
tatttttttt	tttttttaaga
cagagtcttg	ctctgtccac
90600	
caggctgggg	tacagtggtg
taatctcagc	tcacccgaat
ctcggcctcc	cgggttcaag
90660	
cgattctttc	gcctcagcct
tctaagtagc	tgggaactaca
ggtaccgcgc	accacacccct
90720	
gctaattctt	gtgttttcag
tagagacagg	gtttaccact
gttgccaagg	ctggtctcga
90780	
actcctgacc	ttaagtgagc
cacccgcctt	ggcctcccaa
agtcctggga	ttaacaggtgt
90840	
gagccactgc	gcttgccag
gaatatctta	atttagtaag
tatttatata	tgggaaagga
90900	
agggtcaggt	ggtgattcat
aggaactcta	aagtctatgt
ataatactta	gggggacaga
90960	
aggaaataaa	gcataatgot
gataattgat	tgttgagttg
tgtatatgtt	agaagtataa
91020	
cataggagat	ctgattgata
gtaggagaat	gttttttagt
ggtaaaagtg	gaaccgtggt
91080	
ggtttgtttt	ggcagtagaa
tcagttgggt	atagtttgya
tgtggaagtg	aataaacaga
91140	
ccatgltlaag	galgaacttc
ggaatttlgg	tctgagtagt
gggggagtag	cagtgltcat
91200	
catgagggaa	gatgaagact
gaggtaggaa	caggtttggg
agaagatgac	atgttccctt
91260	
ttagcaaaagt	ggatattatg
aaagtggcag	gtaggtgggt
agctatatga	atttgagata
91320	
aaagatttag	gatggagata
taaatttagg	agtaacagcg
tatctatggt	attgtaagcc
91380	
ttaagaatgg	gtaggatcag
ccaggaaata	cagatgtata
tgcagaagag	aggagtcaag
91440	
gaagccaaga	caagltlaag
tlilaagtag	glgatgtagt
ccatgggcag	atgclgctga
91500	
gagggctgca	aacacacagt
accctacaac	atttttaaat
gtcgtcttcc	tgacagcagt
91560	
gactcgtacc	tgcacagatc
ttattttatt	tttctcctgt
agtcctccca	cacttgaatg
91620	
tagacttttt	gaaggcaaaa
tcattgcctt	ttctgagctg
ggagcatgtc	tggcacatac
91680	
caagcactca	acagttgatg
tattgacttc	atccagatac
tctgaggcgc	agttattttc
91740	
tgtactatgc	ctttccactt
tcaatgttta	agagccaaaa
tacagagatg	ggcaccgttt
91800	
ggcatttctt	attttgataa
ccttttccct	gttaagatttt
ttaatgttga	aaaaaaaaaa
91860	
caagaaaaga	gggttaaaaa
tagtcttatg	tcagatccct
tgaatagaat	cacacctggc
91920	
tlagctgtct	gggcacactt
ctatcttggg	tgtcatatta
gcttatctac	agcagaattt
91980	
ttactgtttt	atgtagtaag
gaagcaatta	tatgattatt
tacagacaaa	attattcttt
92040	
atctttttat	tttttagacg
gagtcctctc	ttgtctccca
ggctggagta	cagtgtcgcg
92100	
atctcggctc	actgcacact
cgcctcctg	gggtcaagca
attctctgcc	tcagcctccc
92160	
aaagtactgg	gcttacaggt
gtccgcaccc	acaccagct
cattgttttg	tatttttagt
92220	
agagatgggg	tttcaacatg
tlggccagcg	tgtcttgag
ctactgaact	caggtgatcc
92280	
accgcctctg	gcctcccaaa
gtgctggaat	tacaggcgtg
agccaccgtg	cctggcccaag
92340	
acaaattatt	atactctgag
tgttagaggg	ttaggatgtt
ttcacttgat	gctatggggg
92400	
gaalaaglaa	laagatatga
lacacaacca	aagaccllcc
ttcactatgc	ttctagtagc
92460	
tagtactatg	gatgacacat
ggtaataata	ttggttagca
tttgtcctca	atttactgtg
92520	
ctagttaact	ttctaagccc
cttacaggta	tatatttttt
ttcatcaata	atcctctaa
92580	
gtagttttta	ttattgaact
aattttataa	atcaagaaaa
ttaagaccca	gagaagtaag
92640	
taacttgtcc	aagatcacat
ggcttataag	tgttagagcc
agaatttgac	ccagatgttt
92700	

-continued

gtgactacat	tgtctctcca	taagcagggt	caactctttt	gaactggatgc	tgttccaagg	92760
loactlcccl	agagaagaccl	ltgclgacaa	clacccclcc	tgccclcccl	caaaggclgl	92820
ccattgttct	agaactttga	atactcatct	tagaataaag	ctgggtctaatt	ttttacagtg	92880
ttatagaatg	gatctctgac	tgcaaaagtt	ggctaatatt	atctttttat	gtttctagtga	92940
aaaggcaaga	acaagagaag	acctcagatg	tgaagtcacat	taaaggtaag	ttctgccccl	93000
ggcagtcac	tgcatataaa	agtgatgtgc	tttgcatctg	tgagttcttt	aatcctgtta	93060
taotctctct	tttggcatta	atcattttctg	cottatttta	taataattta	tgattttgat	93120
ttatttccct	cttttaacctg	tataatgctt	taacatctag	cataataaa	gtagggtttt	93180
tttttttttt	tttttttggg	gacggagtct	tgctctgtta	cccaggtctg	agtgcagctg	93240
cgcatcttg	gtccactgca	agctctgtct	ccgggttca	caccattctc	ctgctccagc	93300
ctcccagca	gctgggacta	cagggtgcacg	gcgcacacgc	tggtcaattt	tttgtatttt	93360
ttagtagaga	cagagtttca	ccatgttagc	cagtatggto	togatctcct	gaactttgtga	93420
lccgcgcgc	tcggcctccc	aaaglgclgg	gallacaago	gtgagccacc	gcacccggcc	93480
gtaaagtaggc	tttttttacc	ttaattttat	ttttttgaga	tggaagtctg	ctcttatccc	93540
caggctggag	tgacgtgggt	ccatctgggc	tcactgcagc	atccacctcc	cgggttcaag	93600
cgattctcct	gcctcagcct	cccagtagac	tggtgattaca	ggtggccgcg	accatgcccc	93660
gctaattttt	gtatttttag	tagagacagg	gtttcacccg	gttgccagg	ccagctccaa	93720
acclccgac	lcaaglgatc	cacclgcclt	ggcccccaca	agclccggga	tlacaggcgl	93780
gagccacac	gcctggccat	aagtaggctt	ttactgagcc	ttgtgtgtat	tggtctatct	93840
agtgtattca	gtgaacacgt	gccctcttta	ttaatcacac	atttaattgt	tcctcaaaag	93900
tgattagtcc	actttattta	tttagtaaga	caaaaaatga	agaatactct	taactgagca	93960
gtctgttaac	tgtagaaag	cactgacact	tataaggctt	agttttctgt	catttatcca	94020
gaagtatggt	tgattacagt	ttttactttt	ttatttgaat	gaacaacctt	aatttaaaat	94080
atattttgtt	tattttttgt	tggtatcgat	acattgtcct	tgtttataga	ttagagcag	94140
ctttttaaag	atgctgtatt	actcactgat	tttatattgt	cagtgtacag	agattgaagt	94200
gggaacatta	taattggaat	tgtttccata	gtcattacat	atttaattca	tcaattttat	94260
tcataaaaat	ctgtagattg	ctactatttt	agatttttcc	ttcaaatgtt	tttatgttgt	94320
attgottgca	ctgagtattt	attctatatg	ctcaatttgc	tggaagaaga	gactaattat	94380
aaacttagca	agttgtaaaa	ttagggaana	aagtaaggta	ccttacagcc	tagtttactt	94440
atttcttatg	taaaagcagt	tagattccac	attagttcaa	actgccttct	ttgagcaaaa	94500
ctlgatlggc	agtgataaag	gctlaaagcc	ctctccaago	agagacctgl	aaagactaga	94560
ctgactgtga	gtagaaggaa	ggaacttaga	tgtttcaggc	agtgaagaac	ccagtcttcc	94620
actctaaaat	ttgccaactaa	cagtatgacc	ttgggaagtt	gtaaccttct	tcagattctt	94680
caltltlga	atggggggat	tgccclagcl	aatttctaaa	ctctactlgg	gclaaaaaal	94740
ctctgtctta	tactctgatt	atgaagtaca	taactctgtc	ttaacattca	ctgacttctc	94800
cttaggataa	tacagaagca	gtacaagaaa	cagccctcca	agatgttttg	agctctggta	94860
gaagacaaa	cttatacaca	gaacagtagc	aaatagacca	aaataataat	agctgccatt	94920
tatagaacac	ttctctgttt	ctgggcatta	gacaaaaact	gactataacg	gtgaacaaaa	94980

-continued

aagacttagg	tactgcccct	attgaacctta	cagattagta	ggggagagga	acattaatca	95040
aglaatlcca	cagatggcct	agcctagatl	gglaglgatg	gaagtaaga	galgtgaacg	95100
gacttgaaaa	aaaatccgga	ggcaaaatgg	atagaagttt	attattgatt	aaatatgagg	95160
tgtgagagag	agggatattt	aagattgata	cctaccttct	ggcttgccca	acagaaccaa	95220
aacaggaaat	tatatgttca	gttttgttat	gttgggtggg	agggtctttt	gagtcattca	95280
tttatatatg	ttatatatgt	tattttatat	gcatagtaat	tttaaggtct	gagttttaaa	95340
ccaaagggtta	gagagtgatt	tttttagagtc	tagcaaacct	aagttgaaat	cctgctctgt	95400
gaaatggctg	tttactagct	cattaacctta	gggcaaaagta	ttcaacttgt	tttcattttt	95460
gtcttcatct	ctaaaaatgag	gaaaatatgg	tcttacaaga	ttgtcctgag	agatagatga	95520
aataatatcc	aaaaaaaaaa	aaggtaacata	gagaaactcg	tatagtgcct	ggtatatagt	95580
aggtcctcca	ttgttagctta	tcattatcta	gttttaacat	agccttcagt	ttgttgaatt	95640
agtcaaacctg	agtgaagcac	tgcgaaggaa	tcagaggaa	ttgagatcaa	caaatgattt	95700
ctgaagttta	gggaagactt	catggcaatg	acacttaact	tgtataaaag	ttgaagaata	95760
agaaagattt	gaattgagaga	ttctttctct	tctccctacc	agcccagctt	cttatttgag	95820
gatatatattg	gcnaaggggc	cctcagacaa	gtagagggag	atttttacag	aaagattgag	95880
atgaaggtag	agaaggctgt	aaagaccaga	aaagagaatt	gagacagagg	aagcagggaag	95940
ccactgtagg	tttttagaca	agatattgat	gctgtaagta	tggtgtttat	gaagggttag	96000
tctggaagag	atttgcagga	tggagacccc	ggaagttttt	ttgttataat	acagaaagac	96060
ttgcacttag	ggtgaggtgt	taaaaataaa	caggtaagta	aatgtttaaa	catcttgaa	96120
gaaaagtcac	caaatcttgg	caagttaaca	gataacagtg	aaaaagaatg	ggaccaagat	96180
tttgagtttt	ggagactggg	ggattgaaca	gacagggaac	ttgagaggag	aatcagatga	96240
tgatgtttta	agttgatatt	tagacagatt	gtgcttgaga	tggtaaaagtc	aatgtgggtg	96300
ggaatgctta	gtagcgagta	atcngtgata	caagaccaca	gcccaggtoa	aagaacagtc	96360
acagatacag	atcaggggctt	tttcatctgc	tcacacagag	tgtaccctag	gagctgttgc	96420
aaacagtcac	tgtggagggt	gtgagtaaga	tgtttccctt	gaatttgcaa	gaattacttt	96480
tttgttgttg	tttgtgtttt	ttctgagaca	gattctcgct	ctgttgccca	ggctggaggg	96540
cagtggcgag	atccgcagc	tcactgcac	ctctgcctct	cgggttcgag	tgactctct	96600
gcctcagcct	cccaagtagc	tgggattaca	ggcttgtgct	cccaagccca	gctaattctt	96660
tttgtatttt	tagtagagat	gggttttcac	catgttggcc	agactgggtct	cgaactcctg	96720
gcctcgtgat	ctgcctgcct	cagcctccaa	aagttctggg	attacaggcg	tgaaccactg	96780
caccocgtcc	cttgttaagt	ttattttggg	gggaagcaaa	ggaggtttca	gcttttaaaa	96840
agtttgaaaa	ttattgctct	ggtaataatt	aaagatttga	gagtaaatat	gctttctagc	96900
agaangaata	aangaagaac	agatagcctc	aagaaggggg	gccaagaag	caggtatatt	96960
ctgacacact	gggtgttgat	aaatgggtat	taaaagaaatg	agagcaatga	gcagatagaa	97020
gaggaaaatta	ggagagtata	ataccatgga	gaccaagaaa	gataagactat	caggaaaggag	97080
tggtaaaaat	aagttaactag	ttctaagaga	gatgttaaga	gggaacgggg	aaagccttgt	97140
acaaatgagt	tagtagcatt	ttacattata	tacatcta	taagaaacaa	tgccgagagtc	97200
tcaccattcc	tatagactct	tacttgtact	tgtctgaaca	cgaaaaactgg	cttttgttta	97260

-continued

taaataagct	aaaaattatt	ttgtctcaat	ttctcatgaa	aataaaaaa	aaacctcttt	97320
taacattgaa	aaaatagllt	gaagacagtc	accltltcatt	tlgtaatcc	cacaactall	97380
attgaatgac	tgaanaattatc	tttattctga	agccaaagggt	gtgatactga	tattttctta	97440
gaatactaaa	aataatatttt	atgaattttt	agtgtgcttt	atcttttttt	gttttttttt	97500
tlgagatgga	gtttcaactcc	cgttgctcag	gctggagggtc	agtgtgcaa	tctcagctca	97560
ctgcaacctt	cgcctcccag	attcaagcaa	ttctctctgc	tcggtctccc	aagtagctgg	97620
gattaacaggc	aactgcccc	acaccccagc	aattttttgt	atttttagta	gagacagggt	97680
ttcacactgt	tggctcaggct	ggtcttgaa	tcctgacctc	aggtagatcca	cccaacctgg	97740
ctccccaaag	tactgcgatt	gcaggcatga	gccaccatgc	ctggcctgag	gaatattttt	97800
ctagggtccc	ccacccccaa	gcatttatto	tgaatttta	gttttgttcc	taaagcaagc	97860
aaagtttaag	gatttaaaaa	taatccgtat	tttagaatgc	ttctggctt	tgttactttt	97920
tatccacagt	agaagttctc	agagaatgat	ctccctcttt	taatttaact	ttttggcaca	97980
gtatttttag	aattataaat	aattatagaa	tglttltctgg	clgggtgtgg	tggctcatg	98040
ctgtaactct	ggctacttgg	gaggtcgagg	caggagaatc	acttgaacat	gggaggcaga	98100
ggttgcaagt	agccgaggtc	atgcacatgc	actccagcct	gggtgacaga	gcaagactct	98160
gtctgggaaa	aaaaaaaaaa	aaaaaaagag	tgttttcttt	ctatttttcc	accacttgat	98220
taagttactt	ttcctcttaa	gtattttttg	ctgagtatgc	tgaactaaga	gtaatgttac	98280
aaaatttaal	ttttaaaagt	ctctgaaagc	cccttltatga	gagitttagg	ctatcaaaal	98340
gtgtttaatt	cttaacaatt	ttttgaaaaa	ttatagcttc	aatatccgta	catctccacc	98400
aaaaaagcac	taaaaatcat	gccttctgtg	aggctgcagg	accaagtcat	gttgcaatca	98460
atgccatttc	tgccaacatg	gactcctttt	caagtagcag	gacagccaca	cttaagaagc	98520
agccaagcca	catggaggcc	gctcattttg	gtgacctggg	taagtaacta	tcatttttta	98580
ttcaacttga	ttagaaggat	ttgagtaaca	tatgtgaacc	ttctgtcata	ggataccaga	98640
ctatataatt	ggaaagtgtc	ttggaaaaaa	tgtattttaa	ataacagcta	caagtataat	98700
gggtagctgt	gttgtgttcc	tgtaaatata	gaatataaag	catgccaggt	agaaaaacaa	98760
gcatttccag	aagaaatata	tctgatcact	aaatatanaa	atatgaaaaa	gatgtctccc	98820
tttattactg	agggaaagtgc	aaattaaaaa	aatcagttaa	tgtctccta	acacattagc	98880
atatttttta	aagtttgaca	atttgaatgt	cagtgaagat	gcaggynaat	acccctccta	98940
tttagtgata	atataatctg	gtgaagactc	tttggaaagc	aatttggaaa	tcagtataaa	99000
atatgcactg	catttaggac	actctttcta	agacctagcc	ctcagatatg	ctcattcata	99060
tgigcaggtg	tgtatgtgtg	tgtgtgtgtg	tgltgtgtgt	tgtatatgta	tgtatglatg	99120
tatgtatgta	tgtatgttga	aggctattca	ttatagttat	gtttgtgata	gcaaaaaatt	99180
atggacacac	tataaataatc	tgttatagggt	aaataaccaa	attgttgtat	acgcactgctc	99240
tggagtataa	latagccatt	tgtttctatt	tatttatttt	cltgagacag	ggttttactc	99300
tgttgccacg	gctggagtgc	agtgttatga	tcatgtttca	ctgcagcctt	caactcctgg	99360
gacaaagcaa	ttctctctgc	tcaggctcca	gagttactag	gaactgcaggc	atgtgttaac	99420
acacccagat	aattttttta	ttttttttag	agacagggtc	tcactatgtt	gcctaagctg	99480
gtctcaaaact	cctggcctca	agcaattctc	ccacacaggc	ctcccaaggt	gctgggatta	99540

-continued

ccaacgtgaa	ccaccacacc	tggttcagtg	tagccattta	gaaatctaaa	aaagacgtgg	99600
gaaaaagtcct	aaggcagcgt	laaalgtgag	aaaagcaagc	cacagtagc	atggtaaaat	99660
cogttatatt	aaaataagtt	cttccaaaac	aaaacacat	gcaggagacc	ttttattttgt	99720
cagtattttct	tacccaaatt	tctgcaetta	gaaattgca	tgtcatgttg	tcataagttg	99780
aaaaaaagat	ccatgaacca	atggacttct	aataaaaatca	gtcctgcttt	tgacatctct	99840
ctctactttt	gtgtatattc	aaaccagagt	gtcaatgtgt	ttgtggggca	cacttagcaa	99900
taatacatag	cagacaaaaat	gcataatagct	cagagagtaa	aattgtaagt	tttgctagat	99960
cactcataaa	ttgctgatga	gaatttaaaa	tggtgcagat	gctctggaaa	acaggcagtt	100020
tctttttttc	tttttttttt	tctttttgag	acagggtctc	actctgttgc	gcaggctgga	100080
gtacagtggc	gtgattacaa	ctcactgcag	cctcaccctc	ctcagggtca	ggtgatctc	100140
cctcagtcct	ctgagtagct	gggactatag	gcatagcacca	ccacgcctgg	ctaatttttg	100200
tatttttttt	tttttttttt	gtagagacgg	ggtttcgcaa	tgtttccag	gctggtctca	100260
aactcctgga	alcaaacgat	ccacttgctg	aggcctccca	aagtgctggg	attacggggc	100320
tgagctactg	tgctcgccct	aggcagtttg	ttgtttgttg	tgtttgtttg	tttattttat	100380
tgtagacgga	gtctcaacgg	ctggagtgc	gtggcccaat	ttttggtcca	ctgcaacctc	100440
cgctcccgag	gttcaagcta	ttctcctgcc	tcagcctcct	gagtagctgg	gatgacaggt	100500
gcctgccata	atgcctggct	gatttttgta	tatttagtag	atatgggggt	tcaccatgtt	100560
ggtcaggctg	gttttgaaat	cctgacctca	gggtatcagc	ccgcctcggc	ctcccaaat	100620
gctgggatta	caggcatag	cgtcatccc	tggtgggtgg	tttcttatga	cgtgaaacat	100680
gcaattacca	tatgaactag	cagttgcact	ctgtatttat	ccagataaaa	tgaaaaacta	100740
ccttccaata	aaaacctgtg	cacaaatgtt	catagcagct	taaatatgaa	aaactggatg	100800
ttcttcagca	ggtgaatgaa	ctggttcatt	cataccatgg	aataaccatc	agcaataaaa	100860
aggaacaaac	tggtgataca	tttaaccacc	tggtatgata	tcaagggnaa	tatgctgtca	100920
gacaaaaacc	agtcocctaaa	gactacatat	agtatgatcc	cgtttggata	atatctttga	100980
aatagagaaa	ttaaagagaa	tgaaaagatt	agtgtttgcc	agatgttaga	gaacggggag	101040
tgcaggggggt	aagtgggtgt	agttataaaa	gtgcaacctg	agggatcttt	gtgatgttga	101100
agttgtatct	tggcagtgga	tgcaagaatc	tcaatgtgat	aaaattacaa	agaaactaaa	101160
acaagaatga	ctatagataa	aactggggaa	atctgaacaa	gttagagtgt	tgtatcactg	101220
tcagtatctt	agagtgtat	tgtactatag	ctttgcaaga	tgttaccatg	ggagaaacta	101280
aagtgtacaa	gggatctcta	ggtattatta	tttttttaga	gatgggggtt	cactatgttc	101340
cccaggccgg	tcttgaactc	ctgggctcta	gtgatccgcc	tgccccagcc	tcctaaagta	101400
ctggaattac	aggcgtgagc	gaccatgcct	ggccctttca	gtattgtatc	ttagaacttc	101460
atgtgaatct	agcatatctc	catagaattt	aattaaaaa	aattgtaaac	ctcacagaa	101520
alcagaalit	cctcaagltt	gtgalgttga	caaagatgaa	ctagltgaca	ctgacagtaa	101580
gactgaggat	gaagacacga	cgtgcttcaa	aaaaatgatt	tgaatatcaa	tggtattaaga	101640
agaactcttt	tgcaaaaattg	atgaaaacct	cagtcagttt	tataagaatg	ccactcttta	101700
tgatcatgct	atgaaaagcca	attttttaaaa	aaattttttg	tctttcctaa	caattagctt	101760
gtggttatata	tttaaatatta	gttaaatata	agataaatga	ttttttatta	agtttagttt	101820

-continued

catttttcaa	ggtacgatct	caaagctact	ctttaaccta	ctatgaatga	ataatgctga	101880
glccataaca	cttttglaga	tatalccaca	atllccctc	aggataagtg	ccacaagtg	101940
gaattactgg	actgaaaata	atgcagtttg	ctaagacttt	gctatctgtt	cctgaatgct	102000
cctccaaaa	ggttttgcca	gtttacatcc	toatgaccag	cgaatgnagag	tgttgccat	102060
tlccctgtgc	ccttgllaact	gottaataat	tttlgaaaa	aatctaattt	gacagacaaa	102120
aatgcatttt	atgtaattt	gcttttcttg	gatttttaat	gaggttgagt	atagttttta	102180
atatttttat	tggccocctt	ggaactagta	tcataagttt	ttttcttaa	gaatttatgt	102240
agtcctggct	ggcgccagt	gctcacgcct	ccaatcccag	cacttgggga	ggccgaggtg	102300
ggtggattgc	cgaaggtcag	gagtttgaga	ccatcctgac	caacatggtg	aaaccgaatc	102360
totactaaaa	gtacaaaaac	tagctcagcg	tgttgccggg	tgcctgtaat	cccagctact	102420
taggaggctg	agtcagagag	atcgcttgaa	ccggggagg	ggaggttggt	tgcattgagc	102480
cgagatggc	ccattgctct	ccagcctagg	caacaagagt	gaaaagtctc	aaaaaaaaa	102540
aaaaaaaaa	aaaaagaat	ttacatggc	tgaatlgcca	ttaaaagaga	tatgagaatt	102600
attgagtaac	aaataacttt	ttantaattt	aggcaagttt	tggacgattg	tactttgttt	102660
agaaacaaa	agcctagtat	ttgtagtttt	tttatttact	ttagttgcta	ggaagtaaac	102720
tttattcaag	gtctctggta	ccagttgttg	ctaaaagtga	ttgactaatc	tgtcaatctg	102780
aaattatttg	ttgtgaaect	gctaattctt	ttgcttctat	cttttaggca	gatcttgtct	102840
ggactaccag	actcaagaga	ccaaalcaag	cclllctaag	acccttgaac	aagtcttgca	102900
cgcaactatt	gtcctccctt	acttcattca	attcatggaa	cttcggcgaa	tggagcattt	102960
ggtgaaattt	tggtttaggg	ctgnaagttt	tcattcaaca	acttggtcgc	gaataagagc	103020
acacagctca	aacacagtga	agcagagctc	actggctgag	cctgtctctc	catctaaaaa	103080
gcatgaaact	acagcgtctt	ttttaactga	ttctcttgat	aagagattgg	aggattcttg	103140
ctcagccag	ttgtttatga	ctcatlcaga	aggaattgac	ctgaataata	gaactaacag	103200
cactcagaat	cacttgctgc	tttccacgga	atgtgacagt	gccattctc	tcctgttga	103260
aatggccaga	gcaggaaact	accaagtttc	catgggaacc	caagaattctt	ccctacact	103320
tacagtagcc	agttagaata	gtcccgcttc	tcacataaaa	gaattgtcag	gaaactaat	103380
gaaaagttag	tatgtgattt	tctgtgtgt	acatatgtgt	ctcactttct	ttttttaatt	103440
tactaagcag	aaattcagat	gaggaaatana	atgattggaa	tatttttttt	ctcctctaac	103500
tacttgtaaa	tttgggagaa	tttggagagt	gtagttaggt	cagatcagtg	tatggaaaag	103560
gagcaggagt	gaactggacct	tctaagaagt	gtgttatcag	aattagtaaa	tgaagggtca	103620
aalgtctac	ttttccctc	cactgatltt	gacalcaaac	catlctccac	atagccttat	103680
ttcctccctc	ggtcttaatt	ttattaatat	tttaactgac	tttgagata	aaatttttaa	103740
aaatttttta	aaatttgcca	ataagtgaac	tttatttaagt	tcagtgttta	gtgtatatat	103800
ggatttlalt	lattaglcac	aagaccttg	tgcaggtagt	aggcatgall	atctlttttl	103860
ttttgagatg	gagtccttgt	ctgtccacca	ggctggagtg	caatggcgcg	gtctcggtc	103920
actgcaacct	cgggttctat	gccattctcc	tgcctcagcc	tcaccaatag	ctgggactac	103980
aggcgctcgc	caccacaccc	ggctaatttt	tttgtatttt	tagtagagac	gggttttcaa	104040
catgttcgcc	aggatggtct	cgatctcctg	actttgtgat	cgcctgcct	cggcctccca	104100

-continued

aagtgtctggg attacaggca tgagccaccg cgcocggact gattatctta ttacacatg 104160
 agaaaaccag ggtctagaaa ggtaggttaa ctctctctag gtlglacagt aaalgtagga 104220
 ctagaagcat ttatgacaaga gcacctgttt ttttttcttc tctattagtt tagaatttat 104280
 atactcttaa ttatccactg ggattttgat tagaagacct tcatgttttt ttctatctta 104340
 aatgttcttt glgtctlaaa gggctlaagt atttcttcag atcttttagt tcactcatlc 104400
 tcagtgaact aaatgaggt ctaactctgct actgaatcaa gttttcagca tgttatttcc 104460
 ttctctccctc cctccctctc tcttctccctc aaccaggctc ccgaggagct gggattccag 104520
 gcgcocggca ccaactctgg ctaattttta ttttttagta gagacgggtt ttccactctg 104580
 tggtcaggct gatcttgaa ccttgacctc aagtgaacca cctgcctcgg cctcccaaa 104640
 tgcgtgggatt acaggcatga atcacacac ctgaaggcat gtatttttoa tcgcaaaagt 104700
 actgtaagct gggagaagtg gcacacactt gtactcccag ctactcagga agcttaaggt 104760
 gagaagattg cttgagccca ggagttttga gaccaacctg ggcaacacag caagacccca 104820
 gctcaacaaa agaaaaaaag ttattgaatt ttttatttct alggatcatt tttgtagtt 104880
 tcttattctc ttccaccttc attcccaact ttgatcccat cttttattta tttagtttta 104940
 ttaaatgtat atttgtctga taattctgct atctacagtt ttttgtggac ctgaactcag 105000
 atttctttgt ttctctggat tcagactggt ggtaggttgt gattttagtg atttttggcc 105060
 gtgaacatgt ttcttggaact tttgtctgtg ggaattctct gtgtactctg tataaattaa 105120
 gttacttcag glgtttltga ttttcttttg ccatgcacct ggggcctggg tcaactacct 105180
 totggtacca cttaaaactg aatttttgc ttgggtgtct gtactgatcc tgbatgagta 105240
 caggtttata ctactctag aaatatgggt tttgattatg ggtattgtc ccagatggtg 105300
 ctggagtatt aatatctct ctgttaaaact taatgtgttg tccctgtaaa actccaaaat 105360
 tctgaattcc agaatactac tggcccaaaa tgtttaagat aagggcactg cctgtatttg 105420
 tttctgcctc ccaactatttt ccttagttta acacaaaact acccttttaa aaaaactttt 105480
 gagagaatto agtattggga agagtttcta aactgtttct ggaaatggaa gtccaaagtc 105540
 tgtttctgta attgtttttt ttttgagatg gactctcact ctgtccacca ggotggagtg 105600
 caatgaagta ctctcagctc actgcaacct ccaactcccg ggttcagcg attctcttgc 105660
 ctccgcccc ctgagtactg ggattacagg tggccaccac catgcctggc tgatttttgt 105720
 atttttagaa gagatggggt ttccgcatgt tggccaggct ggtcttgaa cctgactttt 105780
 gtgatctgcc caccctcagc tccaaaagtg ctaggattat gtttctgtaa ttgtaataca 105840
 tttattgttt tttagaaactg tctttgcttt agtggttaatt ttcaataaaa atagaatatg 105900
 cagtggagtt attaaaagag cattagttac atttttccct ttctcattat ctccaaatat 105960
 tatatatagt aagtttgacc tttttaaaat gtataactgt atcagtttta acacatacat 106020
 agattcctgt aactgtccac actataaggg taagaacag ttagtccct cacccttgaa 106080
 gtcaagcccc accctctacc caacacttgg caacogctga tcttctccg tctcaatago 106140
 tttgcctttt ctcttttttt ttcttatttt tttttttgag acagcgtctt gctctgtcgc 106200
 ccgagctgga gtgcagtgag gcaatctcgg ctcaactgcaa cctccgctc ctgggttcaa 106260
 gcagttctcc tgccttagcc tccctagtag ctgggattat aggcacgcac caccaccccc 106320
 ggctgatttt tttgtatttt tagtagaaat ggggtttcac catgttggcc aggtcggctc 106380

-continued

caaactcttg aacctcaagt atccacotgc ctgggcctcc caaagtgcgt ggattacagg 106440
 cglgagccac tglgcccacal caggacllll tllllllaaa tllacatlca actlglcatt 106500
 ttttttttgt atggattgtg ccttcagagt cacacotaag agcccttgc ctaagcaaa 106560
 gtoatgaaga tttttotcata tgtttcoott taaaagtatt gtggttggcc aggtgccatg 106620
 gollatgcot glaatoctag cactltgaga agotgagggt ggacagattac gaggtcagga 106680
 gatcgagacc atccctggcta atgcggtgaa accccatctc tactaaaaat acaaaaaaaa 106740
 aaaaaaatta gccggggcgt gtggcgggca cctgtagtcc cagctaactg agaggttgag 106800
 gcaggagaat agtgtgaacc cgggaggtgg agcttgcaat gagccagat cggcccaact 106860
 cactccagcc tgggcaacac agtgagactc catctcaaaa aaaaaaaaaa agtattatgg 106920
 ttttacactt tacgtttaga tatatactt ttttgagtta atgtcgtata agtatgaggy 106980
 ttacgtcaga ttttttgttt tttgtttatt ttacatagt gatgtctagt tgttctaata 107040
 ccatttgttg aaaagacaac ctttactcca ttgaattgoc tttgtacttt tgcocatatt 107100
 gtctaggcct gttlltggac tcclllllct glltcatgat gtgigtgtct attcatttgt 107160
 taataccaca tgggtctaat tactgtatag taagtcttaa aattgggtaa tgcgtggcct 107220
 ataaaagaa tgggaagtt tttatlttta ctcttatttc cattttctag aagagattgt 107280
 gtgaattgg tgtcatttct tctttagata tttgggtgaa ttgggaagtg atgccatctg 107340
 ggcctagggt tttgtttttt gtgtgtgaga cagagtctca cttctgtcac ccaggttgga 107400
 gtgcagtggt gagalcttgg cltactgcaa cctcggcctc ccaggllcaa gtlactctc 107460
 tgcctcagcc toccaatatg ctgggattac aagcgtgtgc caacatgccc gactaatatt 107520
 tgtattttta atgcagacag ggtttcacca tgttagccaa cgtggtctcg aactgtgac 107580
 ctcaagtgat tagcccaact tggcctccca aagtgttagg attatagatg tagccaccg 107640
 tgctggcag gggcctaggg tttctttttt cagagtattt taaactatga attcagatta 107700
 tttaatagat ataggactat ttaangtato tgtttcttct tgagtgnatt tttactgtag 107760
 tttatggcct ttgagtaatt aattgtattg aattgtcaaa tttatgagcg tgaattatt 107820
 tatagcaatt cgggtttgta gtggatctcc tottttatto ctggtgttgg caattgtgtc 107880
 ttgtttttct ttgtcagatt gtataggat ttatlagtct ttccaagaa ctagottttg 107940
 ttttgatttt ctctgttgtt tgtttcaat tttattgatt ttctgtctct tattatttct 108000
 tttctattat ttctgtctgc tttgggttta ttttactctt ttttttttct ccaagtgtct 108060
 taaagtagaa acttagattt ctggtttgag acctttcttt totaagataa gcatttaata 108120
 ctgtaaatat ccttctaacc actgctttag ttacaccccc acaaatctg gtattttgaa 108180
 ctgagacaaa atgaatgtt ctaatttccc ttgaactta ttcttttaac aatgaattat 108240
 ttagaatat gtattattagt ttgcaagcaa ttggagactt ttttctgtt atttttctac 108300
 catttatttc tcaattcaat atattatggt cagagaatat attttgaatg atttcaattta 108360
 ttaattllla aaaaatacat laaaaaall ttlaaaatgt gaatalacca calacagtal 108420
 aaagattgta catctctgtt ttggacagtt ttctataaat gtcaagttga tttagtttgt 108480
 taatgatggt gttcagtttt tctttattct tgotgatact ttgtatgac ttatatcaat 108540
 ttattactca gaagagtggt gaactttcca actcaaat ttttttccaa ttttacttto 108600
 agctctatct ggttttgctt catgtatttt gaggcctctg tgttaggtgt gtacacattc 108660

-continued

```

aggatgatat cttctgggtg aattgootgt tttatcatta tgtaattccc tctttatggt 108720
aattttcctt gttcclaagat cagaalalat tglgtgccaa tttatataga cactgcagct 108780
ttcatttgat tagtgcttgc atggcatatc tttttccatt tttttacttt tgatctacct 108840
ttataattct atttaaaggg ggcttcttgt aggcagcata tagttgggta gtgttattta 108900
tttatttatt tatttattia tttatttatt tattgagaca gagttttgct ctgtttgccc 108960
aagctggagt gcagtgggtc aatcctggct taccacaacc tccacctcct gggttgcagt 109020
gattctctct cctcagcctc ccaagtagct gggattacag gcacgcgcac catgctctggc 109080
tgattttttg tttttttagt aganaaggat tttcaccatg tttagcaggc tctctctgaa 109140
ctcctgaact cagggtgatc acctgctttg gctcccaaaa gtgctgggat tacaggcctg 109200
agccactgca cccggctgag tcatgttatt tttaatcttt tctcacaata caggggtttt 109260
gttggtaaat ttaattattt taatatataa tttagtataa ttatttacat taatgtaac 109320
tgttgcactg ggttatttat aatgtgtaaa tataattatt ggtattataa taattatatt 109380
actcataata atattaatat ctttggattt agattaccag tttagtataa gttttctgt 109440
ttctccctct ttgatttccc cttttttgct tttttttttt ttttaattct tttttttttt 109500
tagtatttgt tgatcattct tgggtgtttc ttggagaggg ggaattggca gggctaatag 109560
acaatagttg agggaaagtc agcagataaa catgtgaaca aggtctctgg ttttccata 109620
cagaggaccc tgcggccttc tgcagtgttt gtgtccctgg gtacttgaga ttaggagtg 109680
gtgatgactc ttaacgagca tgcgtccttc aagcatctgt ttaacaaagc acatcttgca 109740
ccacccttaa tccatttaac cctgagtggt aatagcacat gtttcagaga gcaggggggt 109800
gggggttaag ttatagatta acagcatccc aaggcagaag aatttttctt agtacagaa 109860
aaaatggagt ctcccatgct tacttcttct taccagaca cagtaacaat ctgactctc 109920
ttctttttcc ccacatttcc cctttttcta ttccacaaaa ctgccatcgt catcatggcc 109980
cgttctcaat gagctgttgg gtacacctcc cagacggggt ggcagctggg cagaggggct 110040
ctcacttccc cagatggggc agccggggcag aggcggccccc caccctcccag acgggggcagt 110100
ggccggggcg aggcgcgcgc caactccttc ccggatgggg ccgctggcgg ggcgggggct 110160
gaacccccc ctcctctccg gacggggcgg ctggccgggg gggggctgac ccccccctc 110220
ctccccagat gggggcgctg cgcggcgagg gctgcctccc caccctccc cgggacgggg 110280
cggctgcggg gctgaggggc tccctacttc gcagaccggg ccgctgcggg gcgaggggg 110340
tccctacttc tcagacgggg cggccgggca gagacgctcc tccctcccga gatgggctg 110400
cggctgggca gagacactcc tcagttccca gacggggtcg cggccgggca gaggcgctcc 110460
tccctcccga gacggggcgg cggggcagag tgggtcccca catctcagac gatgggctgc 110520
cgggcagaga cactcctcac ttcctagacg ggaaggcagc cgggaagagg tgctcctcac 110580
ttccagagcg gggcgcgcg tcagaggggc tccctacatc ccagacgatg ggcggctagg 110640
cagagacgct cctcacttcc cggacggggt ggcggccggg cagaggctgc aatctcgga 110700
ctttgggagg ccaaggcagg cggctgggaa gtggagggtt tagggagctg agatcacgcc 110760
actgcactcc agcctgggca acattgagca ttgagtggag gagactcgt ctgcaatcct 110820
ggcactctcg gaggccgagg caggcagatc actcgcggtc aggagctgga gaccagccc 110880
gcacacacag cgaaacccc tctccacaa aaaaagcaaa aaccagtcag gtgtggcgcc 110940

```

-continued

gtgcgcctcg	aatcccaggc	actctgcagg	ctgaggcagg	agaatcaggc	agggagggtg	111000
cagtgcgcgc	agatggcggc	agtcacgtcc	agcctcggct	ttcacaactt	tggtggcatt	111060
agagggagac	cggggagagg	gagaggagga	cagagggagag	cccccctttt	gctttctttt	111120
ggattatttg	aatttttccot	taaatattatt	tatcttactt	atttatttat	ttttttgagt	111180
gattctcctg	ccacagctcc	caagtagctg	ggactgcagg	catgtgccac	tacacccagg	111240
taattttttt	gtatttttag	tagagacagg	gtttaccatt	attggccagg	ctggtcttga	111300
actcttgacc	tcaagtgatc	cacotgcctc	ggcctcccaa	agtgcctggg	ttacaggcgt	111360
gagccacatt	gccttgcott	ttctctagaa	ttatatattg	agttcttgat	tgtatctttt	111420
tatgtaggct	ttttagtggc	ttctctagga	attacaatat	acatactttt	cacagtgtac	111480
tcacatttaa	tattttgtaa	cttcaagtgg	aatgtagaaa	acttaaccac	cataaaaaata	111540
gaactaggga	tgagggtaaa	aaagagagag	aaaagaaatg	taataaagat	ttaataaacac	111600
cgtttttttt	ttttttttct	tttttttttt	gagacagagt	ctctctttct	gttaaccaggc	111660
tgaggatgcg	tggcgtgac	tggctcact	gcaacctcgg	cctcctgggt	tcaagtgttt	111720
ctcctgcctc	agcctactga	gtagctggga	ttacagggtc	gcgccacatt	gccagctaa	111780
tttttgtatt	tttagtagag	acggtttccac	tgtgttggcc	aggatggctc	cgatttcttg	111840
accttgtgat	tcgctctcct	cagcctccca	aagtgcctggg	attacaggcg	tgagccaccg	111900
cgcccggtca	agttttttaa	tatttttttg	acattgcact	ttttctcttt	tcctcttagg	111960
attttagtaa	ccccaaatgt	agttttgtta	ttgtttggca	ggttctctgag	gctttcotta	112020
cttctttaaa	tttttttttc	ctgtgttcca	gotttgaaaa	ttctatttca	tctgtcttca	112080
aattcactgg	ttcttcccg	ttatttccat	tctgttattg	agtctttgta	gtgaatttta	112140
aattttgttt	attatgtttt	ttagttctaa	aattttcttt	ttttgtgtat	gtcttatact	112200
ttgtctctga	aactcttatt	tgttttcagg	gtgatcttat	ttcttagagc	atgggttttag	112260
tagctactta	aaatttgttt	tatcatccca	gcatatgtgt	cctcttgatt	gtctttttct	112320
ttgtgagata	atgggatttt	ctggttcctt	atatgcacat	taattttgga	ttgtatcttg	112380
gacagtttga	cttaactttac	atgattctga	atcttgttta	aattcctgtg	aaatatattga	112440
agtttttctt	ttcaacaaga	gttgacctag	ttaggttcag	tcacacaaat	ctaagcagca	112500
ttctgtcggc	tctggttcca	tcataagttc	agttttgtat	cttatctgct	tatgtgcctt	112560
tctgtgtcca	gtctgggacc	tggccaatgg	tcagggtccca	aagcctttgt	acacttttag	112620
aaagaggggc	atgcacaccc	agctcacagg	tggccccggg	agtcacata	caactcgacc	112680
ttttcatggg	ctccttcttt	tctgtgatgt	ccctgacacg	ttctgccttc	taagaacctc	112740
cccttatccc	tttctgttg	tctggctaga	aagtcaggga	tttagattcc	ctatacttca	112800
gcacacttcc	tgtagctatg	tcaacctctg	tggccacgac	ttcttcttct	tgggactgca	112860
gtttctcttg	tcagaaagta	ggattcttgg	agctgctgtc	attgtgctgt	tggctgctct	112920
gatgtgcctt	gggagtcgaa	ggagagaaag	gaacaaaaca	aaacaaacca	ggggatttcc	112980
tcacactctc	ttgatccgtg	agagcccccct	ttcctgttcc	tcagaccaga	aatagagggc	113040
ctgtcttgga	acttcttctt	tgtgcactct	gtgtgcagtt	tcagcttttg	agtcacaggc	113100
aggaggtgct	ggacaaactt	gtcaggagta	cggaggtact	gcaagttctg	attacttttc	113160
tcagtcaccc	tgtttccaag	tccttggatg	catttgtcca	ttgttttgag	ttgcattcca	113220

-continued

tgggagagac	agaagagtgt	gcttatttca	tcttgacata	cttattagga	tttcataatca	113280
aatcaacgga	tgatattctc	tatatlaatl	tgcgttttcc	cccttagcaa	gcacatlagg	113340
aaaataacac	tttaacaccc	gcctttgggtg	gtttctgtca	taattattaa	tacttgacct	113400
tttttttttt	tttgagacgg	agtcctcactc	tgctccttga	ggcattgtcc	ccataaaactt	113460
luggtaaagc	atcaataaatt	ttatctttca	tcacacacaag	cttcaccata	aatttgaltg	113520
ttattcttcc	atttttagcag	aattcatggt	gctccaatag	gggctgtctt	caaactgatg	113580
ttttctcctt	cttagtgoot	cagagtagat	cctgttcaga	tacgttataa	caggttaata	113640
tgagtttatt	ttgggttaaa	agtaactttga	aattcatgca	tagtttttcc	atcatatgca	113700
ttttccatag	ctttgaacac	ccccatgtaa	ctctcctctt	ccacaaacca	aaaatgaaa	113760
aagcaacctt	gtgatggaag	tttallttgc	aataggaact	cacagtgalc	taagccctgc	113820
tattcatgaa	tataattcat	tactggagtc	caagtgtctt	ttgggttttt	gaagtctctc	113880
tcttcctctg	caggtataga	acaagatgca	gtgaataact	ttaccaataa	tatatctcca	113940
gatgttgcta	aaccaatacc	aattacagaa	gcaatgagaa	atgacatcat	aggtlaagcag	114000
tgcttgaaac	tatggcaaaa	aaaaaatgac	aaaaaatgca	cagaactgac	aattttcgtt	114060
attgaactaag	ataatttttt	cttaacatgg	aatttagcag	ttcccttctc	aatttgtttt	114120
ctgagtattt	tttatatcgg	attatagctc	actttaaaag	tttctcggct	gcattcgggtg	114180
caggggtctt	tgctcgggcc	agatgggctg	cagtgtagcg	ggtgctcagg	cctgcccgct	114240
gctgagcagc	cgggccggcg	ggcggtctacg	ctaacgggca	cagaccacgg	galggactgg	114300
ccggcagccc	cgcaccagtg	cacgaagtgg	gogggacaga	aaacttctggg	gttggaagtc	114360
cagtgaagct	aaaagccggt	accaaaagtct	ctaggcatca	gggctgcagc	ccaagagctct	114420
caagacacgt	gggcaactgg	atggccagac	agtggtctca	gtggtggcct	ctcgtctcca	114480
gggcttcctc	ccacttctca	gtggggcctga	cgtccctggg	caccctggat	gtctacctgc	114540
attagccaga	gcataccat	ggcctgtgac	ttgccttttt	ttgcacgttg	attgtgcccac	114600
acacagtgto	attttctgtgt	cattttggcac	agctggagggt	gcaaggagga	gggcagocctc	114660
atgtccagtc	ccagtttccac	gttaactttat	tctttctgaat	aaagacaatt	tgtctaacctt	114720
aaacaaacaa	aaaaaaacaa	agtttttctt	atatgttgga	cccaatttct	taggcttttaa	114780
cctgaataac	aatgacagca	agatcaataa	atagtacaca	tttatataac	actcactgtg	114840
tccacagcaa	tattccaagc	actttttatg	gatagactca	ttttaacttc	taaaagaactt	114900
tgtagggataa	atacagttat	tttatagatg	aagaaactga	agcacagaga	agttaagtgc	114960
tttgtccagg	gtaacagctc	agatatggca	gagtcaggat	ttgaaaactag	accctcacat	115020
acctlaactg	ctgtgtgttg	gcaglttttt	tcataactgta	ggtlgggaac	agccttctct	115080
tatgcctcca	ccccctgcaa	aaaaaaaaaa	aaaaaaaaaa	aaatatatat	atatatatat	115140
atatatatat	atatatatat	aatatatata	tatatataat	atatatatat	ataaaatata	115200
tglatlagta	tatatgcala	tataglalal	attatatalt	aglatatala	ctaatalala	115260
atatacatat	tagtgtgtgt	atatatatat	atactagaat	aaaaaaatca	aagtatctca	115320
gagtagtaag	gacaaacatt	tcagaaaaat	gttttcatta	tatatcaatg	tatgtatgtg	115380
tatgtctgatt	caacaaatat	atttcttata	ggttatagca	aaatagtttg	aaagctttta	115440
ctgtgtttta	tcagggaagac	cttaggtgaa	cgtatatcca	cagataaaag	aggttatatta	115500

-continued

```

ttcattcaaat aaatattaca ttctcataag tcctaataatt atgtattttt attcttcaaa 115560
aaagttagla ttltgaltt atgaataaag acalgttctt gcacttllag cagatclgtc 115620
ccgatgtgg gctctcttaa tccttagtgt ggggtgcttg cactcaactca ctgctgggga 115680
cagcaagacc cctgttagtc tcagctgtgt ttcttaatt ggcccaactgt acctccagt 115740
tagctattct ggggtccalg tcatgtlggc tccattttcc tttctttct cccacacaga 115800
tacctataac ggctataaca taggcctggg ggctgttggg ggcttatccc tatctgcttg 115860
tatttaaggg gtaactgttc actgagtttt gctgacagat gttgtcatga gatttgagg 115920
ttctgtgttt gttgctctat ttttatgtgg gaatttgcta ctatcatcat cctagacca 115980
gcttttccta gtaatacaac agggatgttc tgaactgatta gagtttgctt gtttgaaga 116040
ttggttggt agtgattttt ttttgaggg agtctgtacc agttaatago ctgactggg 116100
tgtggataaa aaggagcag ttccaagta aataaaacac ttaaatgaa accacactgc 116160
aactctcttt cttttactta agcttaatca aattaatgat gatgtaatcc catgaaggaa 116220
aagtctcttg aaggataaag ttgataacat ttltgaltca aagaatttga gaaaacctct 116280
atcccaagtgt ctatcattat atattttaag atgttaatta cctgtgtggc tttaggcaa 116340
tcatttttcc tcccttgacc ccaattctta tctgttccaa attatttgtc tctcttgca 116400
gttggaactat ttaatatag ctgtccttca agtgagtttt gttcaaagga gcttcactt 116460
tagctcttac tgtgtaccca ctttgcatag tcttgtttta aatgtaatcc ttggattttt 116520
gggtlgtcta actaattact gttlltatgt gaggatttag agtgatocag aatctlaact 116580
tgoactaact cctcatctt ccaaaaatgt ttgaagtggg agaattttta aaaaacttga 116640
aggtacagct gacagaattt gctgatgggt tggaaagtga tggatgaga gggaaaaaaa 116700
ggataaagc atgactgcat tttltgtttg ttltgtttgt tgtttttgag acggagtctc 116760
actctcgcca ggctggagtg cagtggcgtg atcttggtct acggcaacct ccgcctcctg 116820
ggltcaagcg attccctgc ctccagcctc caagtagctg ggaactacagg cgtctgcacc 116880
cagcctggg taattttttt ttttgtatct tagtagaana ggggtttcac cgtgttggcc 116940
aggatgtct ccatctctg acctcatgat ctactcaact tggcctccca aagtgtgag 117000
gttccaggca tatatataag catataaagt gtgttatago atacaaacag gtatatatat 117060
aaacatgcag tccacacag tgataggaat gaggcagtag tgaaggagaa gttgatgtag 117120
gagaggggac agttgttaca ggaagaagt ctggaggcag aagggatgaa ttccagtgt 117180
cacatagaag attgcttaga tgggagcaag gacaatttat ctagagtca aggaagaat 117240
gcagtacag ggtagagatg caggtaggtt gaaagatgtg agagatgatg gaaataattt 117300
ctgatltct totalatct caaggagca ggaagcaag tctcagcaa agagaalaga 117360
agaggtgcta aatatttgag aaaggagatg tactgtagaa aaaaaaaaaa ctcagttct 117420
ccttctgaac tctcacaana cagaacctt ccatgactct agttgtgtgg ggttttttcc 117480
ctgtcagcla ccaaltclgc agalgtttgt tcaigtgaaca ccaactgggt gtccclaa 117540
tcagttcagt tctcacactg ttacctgga gatagcatca gatccacag attgaggact 117600
ctgtccaca agactgctc cacttcagat gcaagtctca agtacaagtt gtggcctgtg 117660
cttctgactg acctctata aattggagtt cccacagtc cctccttggg ttcaataaat 117720
ttgctagagc agctctcaga actcaggaa atgctttaca tatatttacc catttattat 117780

```

-continued

```

aaaggatatt acaaaaggata cagattgaac aggcagatgg aagagatgca tgggcaagggt 117840
atgggagaggy ggcacagagc ttccatgcac tctccaggtc atgcccacct ccaagaacct 117900
ctacagatatt agctatttcag aagcccccct ccccatctcg tccctttggg ttttttggg 117960
agaacttcatt atatagggcat gattgatcat tggctattgg tgcacagctc aacottcagc 118020
ccctctatcc cggggagggtg gtgggtlaggg ctgaaagtcc caaacgtgta attctgcctt 118080
ggctcttctg gtgattagcc ctcatcctaa agctctttag aggccacagc cacaagtcac 118140
ctcattagcc ttcaaaagaa tccagagatt ccatgaattt taggcgctgt atgctaagaa 118200
actggctaaa ggcagttgc aatgtctcag gctgttaatc ccagcacttt gggaggctga 118260
ggcaggagga tcgtttcagg ccatgagatc aaaaaccagcc tggccaacat agtgagacct 118320
ccttcaaaaa aatttaaaaa ttggccaggc gtaaatagctc ttgtctgtag tctcagctac 118380
tcagaaggct gaggatcact gagccctgga gttgaaggca gcagtgaagc atgactcgtc 118440
cactgaactc ggcttgggtg acaagtgag accttgtctc agaagaaaaa ggaaaaaaa 118500
aaaaactgggc aaagactaaa taacataatt cacagtatca cagatttgta ttgtctagga 118560
aagtgaatgt aaacagacca ggcactagt atgctccctt ggtttcatga aggtccact 118620
aaagtcatga acacaaagt agactaggca tcatgttata tggtttttcc agccatgttt 118680
aacagctagc taaatagcta attgtttcgc tgcagtttat ttagcagtt ccttatttta 118740
gcacatttca tgttttaaaa ttctaccaa taacatttta ataaactttt ttacagataa 118800
cttcacaaat ccataalitt ttaagttaca atcccagaaa tagaattgct cattgaaagg 118860
gtatgttcat ttttaaagtt atgctagaaa ctgcsaaatt gccttcagaa aaaggtgttt 118920
gtatcccccac taacacatagt gttagttttc ttgtgcccct gctcaagtat acatattatt 118980
aaaaacaatg ttgggccagt ttactagata aaaggtgtag tgccctctta ttctaata 119040
tttgattact agtgagtatg tatgtctttt cactgtgggc attttatgtt tgttcccttg 119100
tggattgtca tgtcctttgc tcatltttct ttgggaacat ttcttagtag ttataaag 119160
ctcttggtat tttaatgata gtaacctttt aactgtcatg catgctgcaa atctttttt 119220
tgtttgtttg cctttgtatt ttgtttttg agggtttcta tgtataggaa tttaatttta 119280
tgttgttaaa tcttttgatt tctgttttg catatgtaac tcaaaagact ttctatttta 119340
agatcaagtg ttacctgtat ttcttttag ttctatttaa aacctcttaa ttatattg 119400
tgtgtgttta actcccaagt tgattcacaa gttgttatac atagtttgaa ttagtgga 119460
atttaattat ttacaacttc ttttgacga aggatttgtg gagaagatgg acagggtgat 119520
cccaactgtt tcgtttttgc acagtccata gtcttttagt caatggagca agagtaagtt 119580
agttcatatt ttacacattg gcactcagg gaatttgggt tcattgttag gaatgggctt 119640
cactcagcta aanaaaaaagt atttttgaga atttaaatat ttgggatatt tacaagatca 119700
tataaagcat actctatctt ggttaacagt ttcttttaaa tataaattat gtgaactctt 119760
aaaattttca ttttcalitt caatgttaat atttcootaag tlaaaaaaat ttgtttllag 119820
ttctgaataa atttggggag tgattgagtc tgtagtattt atgaactata gaattgggtt 119880
atttatttaa ataattgaatg tcttcagatg gctctcctaa tttgttagtt aggtcttaag 119940
ctaaatggat gctatataac taatccaca tagatttgtt gaaatggctc cagaggtttt 120000
ttagatttat tactgtatg tgccttaaa aaaaatctat tcatcttcto acttaacatt 120060

```

-continued

tatoagaaga	gtgctctgtg	taagaagtgg	ttaggcatag	tgccagtcct	gaaggaggt	120120
acagcctaai	aaaagacata	gggcaltgtg	tlgggttact	gtaatatgaa	gtggcatgtg	120180
ttaaatgtca	ggggagaact	acaaagtcac	aaaaagtggt	gagagattac	atacaggtaa	120240
aggaantcag	aatgacacca	tggggagtaa	ggtagtgttg	acctaggcct	ttaagataca	120300
alagggacag	tatggaaaga	gtatatlttt	cccaactaaa	ctctttccct	ggctgttccc	120360
tcaaattttc	ctttttgtcc	atgtgcaggc	actttagtga	gtttctgcga	agtcaccatt	120420
totgtaaata	ccagattgaa	gtgctgacca	gtggaactgt	ttacctgggt	gaacttctct	120480
tctgtgagtc	agccctcttt	tatttctctg	aggtaaaagtc	tgcaatttct	ttcacactct	120540
attcgagcat	tccagcctct	aactatcaat	gctggggccc	tgtctatagg	aaataacaca	120600
gaagagccaa	gtcatttcaa	aaaagatgta	tcatgttttc	aagtgttttc	tgatggcaag	120660
agtaatttaa	taatatatta	gagagaacat	gaaaattcaa	tgtattaaat	aactctaatt	120720
ttgagaaacc	taattaaact	actgcatgta	agagagtgtc	tgtttttaat	tatttggagc	120780
lattttaaaa	ccacagaatt	tgaaacttgc	ttccagtgtc	taaatgtcag	accagacttc	120840
agaagagaaa	aaaagttagta	aattttttct	tatgtctctc	atttttactt	tagtcacttg	120900
ataggattgc	ccagtgaaga	agcatttgca	acagacaaag	agtatattaa	totttttgag	120960
gcatacagtt	tagtataatg	ctctttgtta	ggcttcaaca	agtgaattaa	ttttgttgga	121020
aagcaaatga	ctattaaqta	gaaagaggat	tccagctctc	acaaagcagt	aatttagaca	121080
ctcgattctg	ccctcttaca	agaalacagg	tactcagttg	atttgttttc	tcactccctt	121140
tctttgctat	aagtttaaat	caacaatttg	tttaggttaa	tatgtcctca	tggaatgggt	121200
gaatgatcca	gatataaaat	atttggtttg	gttaggttac	tctttatatg	tttgcgtgga	121260
aggaaccaca	aatccagttt	agtataaatt	ttactctagt	tcactaaaag	ttgcatacca	121320
gctgtgtagg	tagtgtttgt	ttcttgttaa	cttttttttc	gtctaaaaga	atacttttaa	121380
acttttcaat	ctcaaatgac	tgtaacctgc	tgacaggtgt	taacagaaaga	agtagatctt	121440
tttgtttttt	gcttatgacc	tgtattttaa	tattttagct	tatagattag	agatttgtgag	121500
agaaatctgt	ttatagtcct	attttccctt	gtgtattttt	tcttctcagt	acatggaaaa	121560
agaggatgca	gtgaattatct	tacaaattctg	gttggcaagca	gataacttcc	agtcctcagct	121620
tgctgccaaa	aagggccaat	atgatggaca	ggaggccacag	aatgatgcca	tgattttata	121680
tgaccaagtga	gttatattga	tagatggatt	cagcagatcc	ttattgaaca	tttgatatgt	121740
tttgtggaaa	taaagatgaa	taaaactcagt	ctctgttgtc	aaggagctca	caggaggccag	121800
cataaaaagct	gcttttataat	ggtgtttgta	aagctttggg	ggttctttaga	acaaaagttt	121860
ctgctgggaa	agggggagggt	tatglggggt	aaacaggatg	gcaatggtgg	tgttcaagga	121920
gtgtttccca	gaagagagat	tttgttttga	tcccaaaaga	agaagggaat	ttgtctaccc	121980
agagaagcca	gaaacaacca	ttctaggcca	aggcatttgc	ccagaagcca	tggaacagta	122040
ggggaaagtgt	gcaactlcaa	gaaacllgag	ttlagataat	caaaggaglg	gggaataaat	122100
atgaggatgc	tggtactaat	tggaaatagat	tgtaaaggac	cttgaatgcc	tattttatgg	122160
tatatattac	ttttctgtata	aatctgtctca	ggcaggttgt	taatttagttt	ttttattagtt	122220
ttcaactgaaa	atgagaggat	ggaaacatca	tacagttaac	aaaattgaaa	atatctgggtc	122280
aggcagatga	tgagcttgtg	gccagctctg	taacgtatgg	tattcttttc	atttaacttt	122340

-continued

tottactctg	taaaaaaagt	aattogtggg	cgggcaacgt	ggctcactcc	tgtaatcac	122400
acactttgag	agggcagaggg	aggtgaatcg	ctlgagccca	ggaatttgag	accagccctg	122460
gcaacatggc	aaaacccggc	tttactaaaa	atacaaaaaa	tagctgagcg	tgatggcgct	122520
cgcctgttgt	cctagctaat	taggggncgt	agggcagaaag	atcaccctgag	ccttggggag	122580
togaggctgc	agtgagctgt	gatccactgt	actccaccct	gggcaggggca	gtagagtgag	122640
accctgtctc	caaaaaaaa	aaaaacaaca	aaggttaatt	gttatttgta	tccttaagca	122700
aatgctanaag	gggttaacttg	gggatagaga	aaagtcacca	gatgttaggg	tttgaagaca	122760
ctaatagtat	ctaggccagt	ggttcctgaa	cattagctctg	tgggctcttg	ctgggctgtc	122820
tgcatagaa	tccactgaga	gcttattaaa	aatagggttt	caggctgggt	gcggtggctc	122880
agccctataa	tcccagcaat	tggggaggct	gaggcaggcg	gattacttga	ggtcagggct	122940
tcagaccag	cctggccaac	atggtaaaac	cccgctctca	ctaaaaatac	aagaatttag	123000
caggcatgat	ggcacacacc	tgtaatccca	gctactcagg	aggctgagga	aggagaattg	123060
ctcagaccgg	ggaggtggag	gttgcaagtga	ggcgagatca	tgccactgca	ctccaggctg	123120
ctgcacagag	ggagactctg	tctcagaaaa	aaaaaaaaaa	ataggttttc	agtcctgggt	123180
ccggtggctc	acacactgtan	tcccagcaat	tggggaggcc	aaggcaggga	gatacattga	123240
ggtcaggagt	ttgagaactg	cctggccaac	atagtgaaac	cttgtctcta	ctagaaacta	123300
caaaaaatta	actgggcatt	ttgacgggtg	cctataatcc	cagctactag	ggaggctgag	123360
gcaggagaat	tgcctgaacc	cgggaggcag	aggactgcat	ctcaaaaaaa	aaaaaaaaaa	123420
aaaggtttcc	agtcocccgt	tctcagaaat	tctgattctg	caggtttgag	gtgtgaaccg	123480
gaatctttat	ttttagaaga	cataccagat	aattctgata	aatagccagt	ttaggagagt	123540
agtctaattt	tccatttttg	caagtaagga	aaataaggcc	cagagaggta	atgatttttc	123600
caaaagtaca	gaacaagtta	gtggcagaat	ttggactgga	atgcagttct	taattgtctg	123660
tccagtgttt	attctggtac	agtatgtttg	tagaaggtat	tacgtaagaa	acattgttat	123720
atagatgttg	agatagggaag	agtttacatt	tagaaaattg	gtctaaaatg	cctgaacatt	123780
caagtcgtgg	aggagtcattg	accaacttac	tcaatacaac	ataggagatt	caacttttgt	123840
tacaaaaatg	ctgattttaa	aggagagttt	tctttttttt	cttctttttt	attttttgag	123900
atggagtctt	gctctgtcac	caggcttaga	gtgcagtgac	acgactccag	ctcactgcna	123960
ccctccacctc	ctgggttcaa	gcgggtctcc	tgcctcagcc	tcctgagtag	ctgggattac	124020
aggtgggggc	caccacggcc	agctaatttt	tgtattttta	gtagagacag	ggtttcacca	124080
tgttggccag	gcgggtcttg	aactcctgac	ctcaagtgat	ccacccacca	ctgcctccca	124140
aagtgcctgg	attataggcg	tgagccactg	tgcacagcct	gcttgttttt	gtatcatata	124200
tatgcatcat	cataactcatg	cattatcaac	ctttgtattt	ctgtcaggac	atagaaacca	124260
ttagagtgct	tggaaagag	cctttttttt	ttctctgcat	ttaatgottt	ttttggtatt	124320
calttcalaa	tcagctlaac	aaaacaltac	ctgcaltata	ccccatcaag	gtagaaalcl	124380
ttgtgttate	aattattggt	actcccttcc	cacacccagt	catcagtaag	tcctgttcta	124440
tccaaatagg	tentatgcat	ctagctcaac	cctcagtgct	gttttgtttt	gaatttgtaa	124500
atgtttactc	ctgatgcctt	gtagttatga	tgatgtgttc	ttatttttat	ctgtgcatac	124560
aagtctccag	ctcgcctttt	agggaaaatg	accatgtctt	cctttcctat	aaattccttt	124620

-continued

ctatctatca	agtcctcaac	agagaatagg	tacccataaa	tatgtgattg	ttagtttttt	124680
tgccctcagtl	gtagtctlgat	ccttacagct	ttlaaacaac	agtagagtlc	accgtcaa	124740
actaaggatg	gttggcaggc	agatagaag	gtagcaagtt	gacccaacta	tctctgggga	124800
agtgggaaca	aagaaagggtt	acatcagcac	tgctcatcac	tagctctata	gttttagggc	124860
tgcaaggctca	atcaagtagc	cttgtataag	attctctgga	ggaggtgctg	aaagttgctt	124920
atacttgcta	tggaatttga	ttttacttcg	gatatctttt	taccataggt	acttctccct	124980
ccagacaca	catctctctg	gatttgatga	tgtgttacga	ttagaaattg	aatccaatat	125040
ctgcagggaa	ggtggggcac	tccccaactg	tttcacaact	ccattacgtc	aggcctggac	125100
aacctgagag	aaggtaaccc	agaacttcaa	acgtatcaaa	ctacaagaag	ttttattggt	125160
agaactcata	aaatataagg	tgggaaaacc	aagcagaata	gcacagtgga	aattgaagca	125220
gtccagcaaa	gtgattaaga	gcagagggcct	tgagtctggc	ctgggtatgta	cagtcacgtg	125280
ccacataaca	tttttagtcaa	cagtggactg	cggtgacgat	ggtcctgtac	gattataatg	125340
gatacaagct	ggttaglgcaa	taataacaaa	agtlagaaaa	aataaatltt	aataagtaaa	125400
aaagaaaaaa	gaaaaactaa	aaagataaaa	gaataaccaa	gaacaaaaaa	aaaaaaatta	125460
taatggagct	gaaaaatctc	tgttgcccca	tatttactgt	actatacttt	taatacttat	125520
tttagagtgc	tccttctact	tactaagaaa	acagttaact	gtaaaaacgc	ttcagacagg	125580
tccttcagga	ggtttccaga	aggaggcatt	gttatcaaa	gagatgacgg	ctccatgcgt	125640
gltactgcgc	ctgaagacct	tccaglggga	caagatgtgg	agggtgaaag	aagtgttatt	125700
gatgatcctg	accctgtgta	ggcttaggct	aatgtgggtg	tttgtcttag	tttttaacaa	125760
acaaatttaa	aaagaaaaaa	aaaattaaaa	atagaaaaaa	gcttataaaa	taaggatata	125820
atgaaaaatat	ttttgtacag	ctgtatatgt	tgtgttttta	agctgttatg	acaacagagt	125880
caaaaagcta	aaaaaagtaa	aacagttaaa	aagttacagt	aagctaattt	attattaaag	125940
aaaaaaattt	taataaaatt	tagttagacc	taagtgtaca	gltgaagtct	acagtagtgt	126000
acaataatgt	gctaggccct	cacattcact	taccactcac	tcgctgactc	accagagaca	126060
acttccagtc	ttgcagagtc	cattcatggc	aagtgcacct	tccagatgta	ccatttttta	126120
ctttttatcc	tgtattttta	ctgtgccttt	tctgtatttg	tgttttaata	cccaaatlct	126180
taccatttga	atagttggct	acgatattca	ttatagtaac	atgtgataca	ggtttgtagc	126240
ccaaaagcaa	taggttgtac	catatagcca	aggggtgtag	tagggcctac	catctagggt	126300
tgtataagta	cactctgtga	tgttagcaca	atggcaagca	gcctaacgga	aattctgttt	126360
attgattgat	tgattgattg	attgattgag	acagagttto	actccattgt	ccaggctgga	126420
glgcagtlgc	acagctcttg	cacactgcaa	cttctgcctc	ccaggttcaa	ccaattatcc	126480
tgcctcatcc	tcccaagtag	ctgggattac	aggcaggcac	caccatacct	ggctaatttt	126540
tgtatttttag	tagagacagg	gtttccacct	tttggccagg	ctgttctcga	actcctgacc	126600
llaagtgatc	lgcctgcttl	ggcclcogaa	aglgctggga	ttacaggcal	gagctaccal	126660
gcctggggcag	taactgaaat	tctctaagtc	cattttcctt	atctgtaaa	tgacgataat	126720
atgcacgttt	acctcaaaat	tactttgatg	attaaagtaa	ggttaagtgt	ataaaataca	126780
tattaacata	gtacctgaca	catggtaagc	atcaaaaaat	gttaactact	tttattacta	126840
ttattattac	gtatttttaa	ataattagag	agcagtatca	aaaattagct	gggcgtagtg	126900

-continued

```

gcactgcacct atagttccag ctactcagga ggctgaagct ggaggattgc atgagcctgg 126960
gaattaaaagg ctgcagtgag ccgtgllcat gccctlgcac tccagcctlg gtgacagagg 127020
aagaccctgt ctggaacat taagaaggc attatgccgc aacgttagct tagaattgat 127080
cccatatata caccagtaac tgtcaacagg attggaaccc tagttttggg tattatgatc 127140
acaaggatatt attaalagct tattaataat aaagcgttgg ctaggcacgg cgaactacat 127200
ctgtaatccc agcactttgg gaggcaggag tgggtggatc acctgaggtc aggagtttga 127260
gaccagcctg cccaacatgg agaaaccccc tctctactaa aatatcaaaa ttagccgggc 127320
gtggtgtgtgc atgcctgtaa tccagctac ttaggaggct gaggcaggaa aatctcttga 127380
accggggagg cagaggttgc agtgagctga gatcgaccca ttgcaactcca gcctgggcaa 127440
caagagcaaa atccogtctc aaaaalataa ttataataaa taataaaaag taaagtattg 127500
atgtttgtga atgatttatt ctctaatga actagaggag atttttccag gaatttcaga 127560
gcaagtggag ttatgttgtt tgtatgtgtc atgtgtatcc aggtgaaaaa acttaattaa 127620
acgtatttat ataataccat acataaaaaa tgaattttag gaatactgaa gaatgacata 127680
tagaagtcac atcattaaat agctagtagt aaacagaata gagtgtcagc tgtaccaca 127740
tgtgtataat attttcacga ttaaaattaa acctttttctg attttaaggg aaaaagtctg 127800
atctgtatca tataaagaat gtaaattttc agggtaataa aattaaaatg cagagagaaa 127860
aatgcaaaaa tagttcttac tagatgtgtg tatgtaagga acttagacta attttaagaa 127920
cactgtcaag accctggtag ttagglagga aaaaagacat gaatgattca ttcaacaaaa 127980
actttgagta tttctgtgct agatggtagt gttacagtgg taacacaaat aaatgtgttt 128040
ctgctatcct gggccttagt ctacaaaaaa ggtacatatt ggcggggcac ggtggctcac 128100
gcctgtaatc ctacgacttt ggaagatcga ggcgggttga tcacctgagg tcaggagtto 128160
aagaccagct tggccaacat ggcgaacccc cgtctctact aaaaatacaa aaattaactg 128220
ggtgtgttgg cggcacacctg taatcccagc taactggggg gctgaggcag gagantcact 128280
tgaacctggg agacagaggt tccagttagt cgagatcatg ccactgcatt ccagccggg 128340
ggccaaagc gaaatcact ctcaaaaaa caaaacaaa caacaaaggc acgtattaaa 128400
taagcaata atattttaca aattatactg aataagttct catgtttatt atttgttgt 128460
ccagttacaa acttttctt cgtagaatta gaaatataaa taataaacat gagaactcat 128520
tcagtataat taataattat taagtgtaaa taanaacatc tatgtacaat taggcattta 128580
tttaagaatt atttgaaaaa aaaaacatgt ggaacacagat attttgatat attgctagt 128640
attgaaattg ataattttct tttgaagagt aaagtgaaca tatatattaa agttaaatt 128700
taactcagca atcacacgcc tggtaggta tcttlaaggaa atcagtttga aagtaaaato 128760
aatatatgca caaagacttt aacatttato ataaaccaga aaatcagat ttcnaattat 128820
atcctatgga ctattttctg ctaaaaagta ttaatatcaa ctttatgtaa taacttctgt 128880
acaaatattt lgggggagaa aaccacaaca aallacatgc attgtaatl ttttttttt 128940
ttttttttta gacagtcctg ctccagcgtc caggctggag tgcagtggtg caatctcgg 129000
tcactgcac ccactatctc caggttcaag caattctct cctcagggoc tcccgagtag 129060
ctgggattac aggcgcctac caccatgcct agctaatttt tatagttttt agtagagatg 129120
gggtttcact atgttggcaa ggctggctct gaactcctgg tctcaagtga tccgtctgcc 129180

```

-continued

toggctctct	agagtgtctga	gattacaggt	gtaagccact	gcaccagcc	ttatgcatta	129240
taattttta	ttgtaaaclg	tacaaaggga	taataactlgt	agtaacaaca	gaagtaaaaa	129300
cattttgttat	aggtagtttaa	cattttgtaac	cagtagaatt	ataggtaaaa	ttttatttat	129360
taaaaacagtt	ttagttggat	ttgatttcna	ctttaaanaa	atgotttttca	tctctatcag	129420
gtctttttgc	ctggcttttt	gtccagcaat	ctttattata	aatatttgaa	tgatctatc	129480
cattcggttc	gaggagatga	attctctggc	gggaacgtgt	cgtctactgc	tcctggctct	129540
gttgggccctc	ctgatgagtc	tcacccagg	agttctgaca	gctctgogtc	tcaggtattg	129600
actgattgcg	tctgccatta	gggagaaaag	catacacatc	ctttccttca	catcccgta	129660
acagatccta	ttatttgtta	attttaagtt	gtggaaaaaa	aagataaaa	ccaggcacag	129720
tgccctgtgc	ctgtaatccc	agcactttgg	gaggctgcgg	tgggcggatc	acacgaggto	129780
aggaattcga	gaccagccctg	gccacatgg	tgaaccccca	tctctactaa	aaatacaaaa	129840
attagccggg	catgggtgca	ggcacctgta	atcctagcta	cttgggaggo	tgaggcagga	129900
gaatcgcttg	aaccocagg	gcagaggttg	caatgaacca	aaatcacgcc	actgcactcc	129960
agcctgggtg	acaaagttag	actgtgtctc	aaaaaaaaaa	aaaaaagaga	gaaataaaat	130020
tgcctactct	actatctctc	aatacaagca	tttgtggtta	cttaaaatat	actgtattgt	130080
aaagtatcat	gctgtttcat	ttaggccatt	attctatttg	aatctgtggc	tgttctctct	130140
aatanaatcaa	gtaatatgga	atatattcat	agcctctgaa	gagctcttta	tgtaagtatt	130200
tattttaggat	actttttgta	aaalaagiga	algaattctt	aggtctctct	ttttttctct	130260
ttcttgagac	agggctctct	cgtctcaacc	tggaaattct	gggtctaaat	aatccaccca	130320
ccacagccct	ctgaatagct	gggactagag	gcctgcacca	ccacgcctgg	ctaatttgaa	130380
attttttttt	ggccagggcat	gatggttcac	gcctgttaac	ccagcacttt	gggagaccga	130440
ggcaggcaga	tcacagggtc	gggagatgga	gaccagccctg	gccaacctgg	tgaaccccg	130500
tctctactaa	aaatacaaaa	attagctgggt	tatgggtggct	catgcctgta	atccagcta	130560
cttggggaggo	tgaggcagga	gaatggcttc	aaccaggagg	tcggagggtg	cagttagccg	130620
agctcacgcc	actgcactcc	tgcatgggtga	cagagtgaga	ctccatctca	aaaaaaattt	130680
tttttttaaa	tgatggagtc	ttgctgtgtt	gctcaggctg	gtattgaacc	ccagaccta	130740
aatgcgcgct	gcttcagcct	aagtttcttt	tttttttgta	aagagacagg	gtcttgcata	130800
gttggccagg	gtagtctcaa	actcctggct	tcaagcagtc	ctccaccctt	ggcctctcaa	130860
agtgtctgga	ttacaggcgt	gaaccactac	ctataatgtt	gtgtttcact	caaggccctt	130920
tgatttctgt	ttgcattacc	gtgccacatt	gtgcatttcc	ttgacctttt	ttgggttttt	130980
tgagtgcttt	tcatalgtta	aaccatacct	gattctcttc	aaaatcacac	aaagtagaat	131040
atcctaagac	aagaaactca	aggaggcata	aagaagttaa	ctgggtttat	taaaactaca	131100
cagtaaatga	tagagccaga	aataattccc	ttctagtgtt	cttcacccatc	agcttaattg	131160
agcataataa	ttttctaatt	actgttgaca	aataaataac	cctttgaatt	ttcaataclg	131220
ggccttggat	aaattttctc	aattttgaag	agagtattat	cgtattgcca	tttacaaga	131280
tctcctgagt	atctttttct	tctgttaagt	ttacctagga	gataaactgc	tgagtatggt	131340
tgccattttg	gttttttgat	ataggttaga	atgtcttggt	tttttttttt	tttttttttg	131400
gtttttgttg	ttgtcaattg	ttgagacagc	atcttgctct	gtcgccagg	ctggagtgtca	131460

-continued

atggcacgat	cgtggctoac	tqcaacotcc	acctocccgg	ttoaagcaat	tctcctgcct	131520
cagcttcctg	agtagclggg	atlacaggca	tgtgaacca	caoctggcta	atlttlgtgt	131580
ttttagtaga	gaaggggttt	caccatgttg	gtcaggctgy	tattgaacty	ctgacctcat	131640
gatccacctg	cctcgccctc	ccaaagtgtc	gggattgcag	gnatgagcna	ctgcaacctg	131700
ctgaatgtct	tgtttttgat	taggcactta	agaaaggcct	aggtactaac	cataaaatat	131760
atttttatcc	ctttttgtga	tactatatat	atagaaaact	gcacttatca	taaccttaga	131820
ccacttgaag	aattgtccca	agcagaacta	acccatgtga	cccagcatcc	agatcnaaaa	131880
cagcattatc	agccccccta	gaagccctct	tgggccctct	ccattcactg	tcctcttgtt	131940
caccagggtta	gtactatccc	tgaactttga	tggcatagat	tagcattacc	tgttcttgtc	132000
attttataaa	taaaaaccata	ctgtgtatto	ttttcttgta	cagctttatt	gtgctaatto	132060
acatttaccat	catacaattc	agtgyttttt	atatggctac	agagttagggt	aaocattacc	132120
acatcgattt	tagaacattt	ttttcactcc	agatagaaaa	cccttttact	taaacctcca	132180
atcccccaact	ccaccagccc	taggcagcca	ctagtctact	ttttatctct	atagagacaa	132240
tagatttgtct	tattctggac	atttcataaa	catggaaacc	tatatattgt	ggtcttttgt	132300
tgcnaactgt	ctttcactta	gcataatgtg	ttcaaaaagag	catcatgta	tcactgtttg	132360
gcattgtatca	gaatttttatt	cctcattatg	gccaatatcc	ccattgcaag	gatttatgac	132420
attttatttg	aattgtaccc	tcctttctgc	catttatcaa	taatgctact	gtgaccattt	132480
gtgtacaagt	ttttgtgtgg	atacagggtt	tccttttgtt	tttaaatltg	aggtggagtc	132540
tgtctctgtc	gcccaggtcg	gagtgcaagt	gcacaatctc	ggctcactgc	aaactctgtc	132600
tcctgggttc	aagcagttct	cctgcctcag	cctcccgagt	atctgggact	ataggcacgc	132660
accaccacgc	ccagcttaatt	ttttagtaga	gatgggggtt	caccatgttg	gccagctctg	132720
tctcgaaactc	ttgacctcaa	gtgatccacc	catctcggcc	tcccaaagtg	ctggggattac	132780
aggggtgagc	cactatgcac	ggctgtggtt	ttcatttctt	ttgttgtata	taactaggag	132840
tagaattgct	gagtcacag	gtaactctta	aacttattga	aaaactgcca	gattgttttc	132900
cgaaaaggct	gcaccatttt	gcactccacc	cagcagtgta	tgagttttac	agcttctcca	132960
catttcaattg	gaacttatta	tctgtttggc	tgtttttaaa	aatgatagtc	attcccaata	133020
gttctacttc	agtggtgttt	ttgcactctc	ctgatgagta	atgatgttga	gcactctttc	133080
atttgcttat	tggcccttgt	tctagctttg	gaaaatgttt	tattcaaatc	ctttggccat	133140
ttttattttt	atttttattt	attttttttt	ttttgagacc	aagtcctact	ctgtcagcca	133200
ggctggagta	caatgggtgtg	gtctcagctc	actgcaacct	ccgcctcctg	tgttcaagtg	133260
attctctctc	ctcagccctcc	cgagtagctg	ggattacatt	tcaggcacct	gcccagcatg	133320
cgggctgatt	tttgtatttt	tactagtga	agggttttcc	catgttagcc	aggtctgttc	133380
cnaactcctg	acctcaggtg	atctgcctgc	ctaggcttcc	cnaagtctct	ggattacagg	133440
cgtgagccat	tgggcccagc	ctagattttc	ttttttcttt	tttttttllg	gaaggagtct	133500
tgtctcttgt	gcccaggctg	gagtgcaatg	gcacaatctt	ggctcactgc	aaactctctc	133560
tcctgggttc	aagcgatttt	cctgcctcag	cctcccccag	agctgggatt	acaggtgctc	133620
accaccacac	ccagctaaact	tttgtatttt	tttttagagac	agggttttcc	catgttggcc	133680
aggtgtgtct	caactcctga	cctcaggtga	tcacactgcc	ttggcctccc	gaagtgtctg	133740

-continued

gattacoggc	atgagctaac	aggcccagcc	aattttctca	ttatattgcc	caggctggtc	133800
tcaaacctcc	gggttcaagc	gatccctcct	ccctggccct	ccaaagtglg	gggagctacg	133860
gcgtgagcca	cattgtctcag	cccctttgcc	cattttttaa	ttagattgcc	tttttatatt	133920
gagtttcagg	agtcctttat	atattctaga	taaatgtccc	ttatcaaat	atattatttc	133980
caggattttt	cttcaltcig	tgagllgtct	ttcctctacc	ttttaaaaaa	gggtgggttt	134040
tgttgttttg	ttgttttgtt	tttttaagat	aaggctctcat	ctgctgccc	aggctggagt	134100
gcagtyggac	aatcacagct	cactgcaccc	tcaacttcct	gggcccaggt	gatcctotta	134160
cttcagccct	ctgaatagct	agggccatag	atacacacta	tcacaccacg	cttttttttt	134220
ctgtttgtag	agacagatct	tactgtgttg	cccagtttg	ctcacaactc	taggctcaaa	134280
glgattctcc	cacctctgoc	tcccagagtg	ctgggattac	aggtgtgagc	cacacgcaac	134340
ctgtcttttc	actattaata	gtgtcttcct	gcttcagcct	cccagtagcg	tgggtttaca	134400
ggcaccacac	accatgcctg	gctaattttt	ttgcattttt	agtagagaca	gtgtttccac	134460
algttcaccc	ggctggtctt	gaacacctga	ccctcaggtg	ttcaactgoc	atggccctcc	134520
aaagtgtctg	gattacaggc	gtgagccact	gcacccggcc	aaatatttgc	cttcttaaca	134580
gtattgtctt	ctaatttttg	aacatggatg	tatcttcctg	tatttatgtg	ttcttctatt	134640
tcagcagaat	tttgtagtgt	tcagagtaga	agcctttcac	ctccttgggt	cattttattc	134700
tatgttttaa	gtttctttcg	attccattat	aaatagaatt	gtttctttaa	tttcattttc	134760
agattgtttg	atgagagagc	atagaaaata	aaglgatttl	lacatgttga	tcttgcaaac	134820
tcaactttga	taaatctgat	tgtagctct	aatagtttct	ttgtggtatc	tttaggattt	134880
tcaatatata	agatcatgtc	atttatggat	agagatagtt	ttttttcttg	ctagaaacta	134940
cagagcaatg	atgagtagaa	gtggcagaag	caaaaatctt	tgtcttgttl	cctatctgac	135000
agggaaagct	ttcagtttca	tcatttaata	tgatgttagg	tgtgggtttt	caataaatgc	135060
ctttttctag	attcaggaat	ttccctatca	ttcctgattt	tttaaggctt	tttttttttt	135120
ttaaatcatg	aaaggggtgt	gaatattgtc	atgttcttct	tgatcatgta	taaatgatcc	135180
tatggatttt	gggttttatt	ctgttgatgt	gaatatattc	ttgattttca	gatgttaaac	135240
caaccttgcc	tactcgagat	gaatctcaat	tggtcaatgt	gtataatctt	ttcaatctgc	135300
tgtgtgattc	catttactgg	tattttgttg	aagattttgt	atctgaacgc	ttaaagataac	135360
atttacactc	tatcagaaat	gaattgacca	tcaatgtgag	agtgattttg	tgggttcttg	135420
attctcttcc	attccaaaag	tagacataca	tcctgtgtga	tgtctgtctt	tatgccagta	135480
ccatactctc	ttgattacta	ttgctttgta	ataagttttg	aaatcagaaa	gtataaatga	135540
gatttttgta	ctgagtagaa	agtcctcata	gaattagttg	ggaaatattc	cctctttatt	135600
ctggtccctc	tttctttttt	gtttaaatgt	gtatcttggg	gattgttccct	ctcacaacaa	135660
tgagagccgc	tttccctaac	ctcccaaccc	tgtatatagc	aggctataaa	gtgtctgttc	135720
aattattttt	tttacttaac	ctattactta	gtcggggaca	ttaaagcttg	ttatgtcttl	135780
tatttttaaac	aatgctgcag	tgaataatct	tgtatataag	tcattttcca	tcaatataag	135840
tctctctgta	actgaatttt	tagaagtggc	atttctaggt	caacctatgg	ctctgtattt	135900
cacaaaaata	ccaattctgg	tttttcttgt	ggaggtgggg	agtaggaggt	agaatgctgg	135960
aggagaaact	gctgtactca	gctggctagt	cattttagaa	aggtttccct	agcttctttt	136020

-continued

tgtoatatgg	cotcaccaa	aatcaaaaac	attcotattt	acootgtaaa	catggggcct	136080
tactacccaa	gatacalatt	tctggalgta	tgacagcttt	tcatattgaa	gaataaalga	136140
tgtaggtaca	gcacatttgt	tggaacttag	gtcgttaaga	atgtcttata	aattcataca	136200
ttatacattt	tattttattt	tatttttttag	tttttgatac	agagtcttcc	tctgtcgccc	136260
aggccagcgt	gcagtggtac	aatcttggct	cactgogacc	tccatctcct	gggctcaagt	136320
gattctcatg	tctcagcctc	cagagtagct	atggttacag	gcctgcacca	ccatgcccgg	136380
ctaatttttt	tatttttagt	agaaactggg	tttcaccata	ttgaccatgc	tggcctogaa	136440
ctcttgccct	caagtgtatg	gcctgcctca	gcctaccaaa	gtgctgggat	cctgttattg	136500
ggtaaaagat	gaatatttag	ggctgcctgg	tggctcatac	ctgtaatccc	agcactttct	136560
gagactgagg	tggggaggagt	cctggagccc	aggaggggtga	ggctgcagtg	agttgtgato	136620
gcgccattgc	acttcaacct	aggaattata	ggcttcagtc	actgtgcccg	gcctgtacat	136680
tttaatatgt	tgctttctct	tttttagtat	agtatgaggt	tacatttcag	agtoatttgt	136740
gttaagcatc	ttaatatgtg	tgaggttagg	tgaaagttae	ttctatttca	aacactgaag	136800
aaaattttgt	acaaatctgt	cacattccaa	gccaggact	gattgtttca	tatacttcta	136860
attttacaat	ttctatttga	gtccagtgtg	aaaaaagcca	gtattaaaat	actgaaaaat	136920
tttgatgaag	cgaataattgt	ggatgcggca	agctcggatc	cagaatcttt	atatcaacgg	136980
acatatgcgg	ggtaagctta	gctcatgcct	agaattttta	caagtgtaaa	taactttgca	137040
tcttttaaat	tttttaatta	aattttacat	ttttttctaa	tctattatta	tatgccaga	137100
actttcaact	agagtgtgca	gtataatgtg	gtggttaagt	ataaaggctc	tggagtgact	137160
tctgggtgtt	taactctggc	tctgccattt	attggcagcc	gctaacctct	tggtatctca	137220
gtttcttcat	ctgtaaaatg	agaataataa	agtgaaaaga	tgccaacatc	atttactctg	137280
ggctgcataa	ctgatacttg	gaaaaagtat	tcccttgagt	taaagaatta	agttggttat	137340
tcatttttag	ttgtaataaa	aagatagtga	ttcataggat	atgccactta	ctgaatttta	137400
ccacagatcc	aatcataaaa	tcactttctc	ttccctaagg	atagcttgat	taacatgtaa	137460
aggtgtgtaa	aggtctgatt	acactaccc	gatccgtacc	ccagttccca	gcagacacct	137520
gaanaaggga	tttcaacata	tttaattact	ttcaagttaa	agtaacagtg	gtaggccagg	137580
cgcagtggtc	cacacctgta	atcccagcac	tttgggaggc	caggtggggc	ggatcacgag	137640
gtcaggagat	tgagaccatc	ctggctcaaca	cgatgaaacc	ccgtctctac	taaaaataca	137700
aaaattttag	cggggcatggt	ggcaggccac	tgtagtccca	gctaactggg	aggctgagac	137760
aggagaatgg	cgtgagcccg	ggaggcggag	cttgcaagtga	gcttagattg	tgccactgca	137820
ctccagcctg	cgcagtgagg	cgagactcct	gtctcaaaaa	aaaagaaagt	aacagtggta	137880
ttgggagact	gaggagccta	gaaagtactt	gaagggaagta	aaaggtttgt	ttgaccacat	137940
tgtatttggg	aagccagcct	ttcagctgtg	gtcagctttg	tgtagtgatt	tttagttctt	138000
ctlttagaaa	ataaccggca	aggccgggca	cgttggctca	cgcctgtaat	cccaccactt	138060
tgggaggccg	agacgggcgg	attacctgat	ctcaggagtt	cagaccagac	ctgggcaaca	138120
tggtgaaccc	cgtctctcac	taaaatacaa	aaagttagcc	gggcgtgggtg	gcgtgtgcct	138180
gtagtccacg	ctactccgga	ggctgagcca	ggagaattgc	ttgaacccgg	gaggcggagg	138240
ttgcagtgag	ccaagatcac	accattgcac	tgcagcctgc	gcgacagagt	aagactctgt	138300

-continued

```

ctcaaaaaat aataataaaa taaaaaagaa tggacagtaa acctaaatga gttcattccc 138360
aaagatgatg ttattcttaa gggatgggtc atttatttaa gacottacat aaagtctalc 138420
aatgtcgtga tttttcactt ctgtaattgt gtgtatgtat aatgtaata tatatgtttt 138480
tgttttgttt tgggtttttg agacggagtc togotctgtt gtcaggctg gaatgcagtg 138540
gtgcaatctc agctctctgc aacctctgtc toccagggtc aagcgtttct tctgcctcat 138600
cctcccaagt agctgggact acaggcacgt gccaccacgc ccggctaatt ttttgtattt 138660
ttagtagaga tggggtttoa cctgttttagc caggatggto tcaatctoot gaactcgtga 138720
tccaccgcccc ttggcttccc aaagtgttgc tattacaggc atgagccacc acaccagca 138780
tgtatttttt aaatgtataa aatgaagcag aaaagagaaa tgataatttt tottcatctt 138840
gaaagattat ctccaccagg cgcagtggct cacacttgta atccaccgac ttggggaggo 138900
ctcggcaggo ggcctcactg agttcgaaac cagcctggcc gacatgggtga aactccgtct 138960
ctactaaaaa taataataaata aagatgggtt taatatatgt tttagtttta tgatttttag 139020
atctttctga aattttctc aaggcaagta aatttgtatc agttgtata ttggtaccca 139080
tctatgaaat aacttattag gaagatatct ctaaaataag atcactttgc ctaaaaataa 139140
ctgatataat gatgttcaaa gaatttttct ttttaaccgac ttgataaatt cattattctt 139200
gacgtcaagt gatccacctt cctcagcctc ccaaatgtct gggattacac acatgagcca 139260
ccgcacctgg cattattctt ataaaagggt aaatttctag ttaagttaa tgcctctttt 139320
gttcattgac cattgttat tttctccct toclactcac agtaactatt ctattgggat 139380
gcacttttgt ttgcttattt ttatgtaatt gatattacgc tcaattctgt acgttgtact 139440
ttcattcaca gtgagttttg gacattccta tgtcactcta tacaagetta ctccatttta 139500
actacactgt agtattccgt atgtaatat tactataact catcactgta gcagagcaco 139560
tcatagtgtg tgtattactg ttttgccatt ttgggtatcaa tgagtattta agtcatttgc 139620
agtttttccc tcttataccc agtattacag aggatctctt ttatatgtct tcttgtacc 139680
aagaggcaga ttaaaaaaatt tttttttgaa aaattttttg aaaaaaatg aaatgaagtc 139740
tccctatggt gcccaggctg gtctcaact cctaggctca agcaatcctt ccatcttgcc 139800
ctcccaagtc gctgggttta caggcatgag ccaactgccc tggcctacat tttaaathtt 139860
gatagctctt acaatttact ttgtaaagta ctgcatcat ttattgttct caccagtctt 139920
taataagaat acttcatact tttggctgga cacagtggct caggctgta atccaccgac 139980
tttggggaggo cgaggcgggc agatcaagag atcgagacca cctgggcca tatggtgaaa 140040
cctgtctct actaaaaata aaaaaattag ctgggcgttg tggcgccccc gtagtcccag 140100
ctactcgaga ggttgagaca ggagaatcac ttgaacccgg gagtgaggg ttgcaglgaa 140160
cttagatcac accactgcac tccagcctag caacagagtg agactctgtc tcaaaaaaaa 140220
aaagaaatca ttcagactta attttttttc cagtcttaag tgtttgctaa tgagattgag 140280
ttcttttttg latgtctctt gattgttcag gtlllltctt ttatgaattg actgttccat 140340
tctttttcac attatttctg ttgggtgatt ttattagtg cttgttaaaa ttctgtatat 140400
tttttcagca tgcacactca ttattcaaaa aaaaaaaaag attctctatg ttcttcgata 140460
ctaactattg gttggtaata ccttaaaaat aagaccctta ctgtattttt tgcctttttt 140520
tttttttttt tttttttttt ttgagatag agctctgtct tgttgcccag gctggagtg 140580

```


-continued

```

aatgggtatga tctcggtctct cagctcactg caactgcaac ctctacctcc ctgtttccag 140640
caatlctcccl gcctttagccl cccaaglagc tgggattaca ggaalccacc accacaccua 140700
gctaatttttt gtattttttag tagagacagg gtttccaccat gtgggccagg ctggtctcaa 140760
actactggcc tcaagtgatc cgcctgcctc ggcataccaa agtactggga ttacaggcat 140820
gagccacagt gcctagccac tttttgcitt ttaacittgt tttatagtac tatagtttta 140880
gtataaacag atgtatgtat acacacaact atggccttat aatatgttcc agtcattgtt 140940
agagcaaggg ctacaccttg ggtgcttctt ttacaaaatt gtcttggcta ttcttgtgco 141000
ttttttctta tttgtgaatt ttagaattgt gaattacctg ttgactcacc atgtttttga 141060
aactgaggat tttgaatgga attgcactca attaaagatt atcttgettt ctgtgcagca 141120
atgttttatt tcaataaalc cctactttaa attaacttag atagctataa attgtgttcc 141180
tggtcttcta gatttagatg aaacgcttta aattgattgt ttctcctaa atttaaaact 141240
gattgttaga agttaaaagt tctgttccat tcttatttag gaagatgaca tttygaagag 141300
tcaglgactt ggggcaattc atccgagaal ctgagcctga accgatgta aggaatcaa 141360
aagggtttgt gtgtttttat acttcattat aagcctttac tcacattagt gattgactgt 141420
aagtcaaga ccaactaagg tttaaactgt ttatttttga aagttaacc tgatctcttc 141480
acctgtgttt tatagtcaga agtaagtaca agggcttccct gtagtcacat ctttatgcaa 141540
tctcctctga atcaaaaagt agtgaacttg ctttgccact ccagaaggca catgaatatg 141600
aaaaagcalt gtclattttc tlatltaalg gcaaaaalac cgacclaaat lggacttaat 141660
gtttgagacc gtttatttta ttaaattata ttttttctct ttctcttttt ttttttgaga 141720
cagtctctgc tctgtcaacc agaccgagat gcagtggctc gaccgcacct cactgcaacc 141780
tcgtcttccct aggttcaagc gatlttccct cctcatctcc ctgagtagct gggactacaa 141840
gtgcgcacca ccacacctgg ctaatttttg tatttttagc agagatgagg ttccaccacg 141900
ttggctaggg ttgtctcata ctccctgacct caagcaatcc atccgccttg gcttcccaaa 141960
gtgctgggat tacaagtgtg agccaccatg cctggcctta ttaaattatt tttattaaat 142020
ttcctcaaga ttgatgaag taatgaata taaagtaat gaattatatg tggaaaatag 142080
actggattaa gaaaatgtgg cacatatacc ccatggatcc tatgcagcca taanaaagg 142140
tgagttcatg tctctttag gtacatggat gaagctggaa accatccttc tgagcaaaact 142200
gtctcaagga tagaaaacca aacaccgat gctctcactc ataggtggga attgaacant 142260
gagaaacact ggcacacagg tggggaaact cacacgctgg ggcctgtcgt ggggtggggg 142320
gtcggggggg gaatagcatt aggagatata cctaataata atgacgagtt aatgggtgca 142380
gcacaccaac atggllacatg talacatatg taacaaagct gcacgttgtg cacatgtacc 142440
ctagaactta aagtataata aatttaaaaa aaataaatat atgtggaaaa tatataatag 142500
tcaaaatcca aattgttcat ttaatacaga gagtagttta gtcaaatcca aggggttagac 142560
aacagaaalc ttttttgcac agtgcaltct ttltgactga tticatttcc ttctgggttt 142620
acacaggaaag atttcagaaa caaatgtgga tccgtgacag atggtatcta gaagttttta 142680
gtttgtttga attgaacgta ttttatttag taaaagatcc taatttttgt aagaaagaaa 142740
attcaatttt gataagtatg ttaagatta agagctattg gccaggcgct gtggctcatg 142800
cctgtaatcc tagcacttg ggaagctgga gcaggtgggt cacaggttca agagatttag 142860

```

-continued

accatcctgg ccaacatggt gaaaccctgt ctctactaaa ttagccaggc gtggtggcac 142920
 algcctgtgc accgcgcctcc ggggttlaagc galcctactg cctcaggcct ctgagtagct 142980
 gggattacag gcgcacatggc taattttttgc atttttagta gagacagggt ttcactacat 143040
 tggccaggct ggtctggtct caaacctctg acctcagggt atctgcccgc cttagcctcc 143100
 caaagtgtcg ggtattacagg catgattcac catgtctggc catttatctt attttctttt 143160
 tttttttttt ttttgtttga gacggagtct tgcgtgtctg cccagagctg gagtgcattg 143220
 gtgcgatctc agctcactgc aacctctgct tctgtgggtc aagcaattct cctgcctcag 143280
 tcttccaaagt agctgggatt acaggcgcgt gccaccacat ctagctaatt tttgtatttt 143340
 tagtagagac aggggtttcac catgttggcc aggctggtct cggaaactct gacctcgtaa 143400
 tctgcccacc tcggcctccc aaagtgtga gattacaagt gtgagccact gtgcccagcc 143460
 atcttatttt ctctcttttt ttttgtcggg tgggaggggg acagagtcta gctctgtctg 143520
 caggcttggc tcaactgcac ctctgcccc caggttctag caattattct gctcagcct 143580
 cccaagttag tgggattala ggcacctgcc accagcctg gctaattttt tgttattttt 143640
 agtagagatg gggttttgtct atgtttgacca tgcctggcctc aagtgtaccg cccaccttgg 143700
 cctcccaagc tactgggctt acaggcgtga gcttgtattg ggtaaaagaa caatatttgg 143760
 ggctgcattg tggttcatac ctgtaactct agcactttgt gagactgaga tggaaaggagt 143820
 gttggagccc agggagggtga ggcctcggct gcagtgaatt gtgatcacgc cattgcactt 143880
 ccaactaggc aatggagcaa gaccatgct ctaaaaaaca aaacacaall tttttaaggga 143940
 ataactggga gaggtcagtg tgggttttag aacagaggaa gtgccagatg acctttgtga 144000
 ggcattggcc aggaagaact ctacagtgtc tttaggtagc ttctgtccat aaggataatg 144060
 gggctctctc cccagtattt atagaaaatc tctgagctgt ttttttttgt ttgttttttt 144120
 tgtttttttt tctctgagatg gagtctctct ctgtcggcca ggcctggagt ctgtggcgcg 144180
 atcttggctc actgcagct ctgcctccca ggttcacacc attctctctg ctacagcctc 144240
 caagtagctg ggaactacagg tgtccaccac cagccccagc taattttttg ttatttttag 144300
 tagagatggg gttccaccat gtccagccagg atggtctcga tctcctgacc tctgtatccg 144360
 ctgcctctg ccttgcaaaag tgcctggagtt acaggcgtga gccaccgtgc ctggcctggc 144420
 ttttttttgt ttgttattta ttattttatt tattttttt ttgagacaga ctctcctctc 144480
 gtcgccggg ctggagtgta gtggcacgat gtcggctcac tgcnaagctct gctgccagg 144540
 ttcaagccat tctcctgctc cagcctcctg agtagcaggg accacaggcg ctgcgccaca 144600
 cgcctggcta attttttgta tttttagaag agacgggggt tcaccgcatt agccaggatg 144660
 glctcgatct cctgalgctg tgatccgccc accctggcct cccaagtgc tgggattaca 144720
 ggtgtgagcc accgtcctg gctgtatttt tttttttttt taatctggct tcatacctct 144780
 gacagctcat gaagaagtgc tctgtcttca tatgttatgt tgttagcata gtgttaacct 144840
 agcatagggt tccgggtlil gcagllilct ttglillal algaattaa gtgtattal 144900
 agcagttgaa gatataagg aaatttttcc ccaaaacct atctctgctc gttctattca 144960
 ttcagctctg ttatgtttat ccttcattca ttcattttat agaacagtgg agtgcctact 145020
 gtatgcactc attgtctcgt gtcctgggga agaaaacaaa gttcctgctt ccatggaaat 145080
 tacattatat tggcggagac agtaacagac aaacaaatgt agcctgtgta catgtgttac 145140

-continued

atgaaaagca	gggtaggggg	ctgggagaga	gtagtaggga	gtgctatatt	cgaggtggtt	145200
gtcaggaaa	gcttcactga	gaggttgcca	ttltgagtag	acctgagcgc	agcggggcgc	145260
taagcccaag	cagcatgtgg	aggaagagtg	ttcttggtga	aaggaaacaag	gatagaggcc	145320
cgaagctaga	gagctcagca	tgatcaagga	acagcaagcc	cngtgtggct	ggantggagt	145380
gagcaaaagga	atgagcagta	gaaggtgagt	gagtlgggag	gtcaccagag	acctggcaca	145440
ggacttgaaa	gtctcaggga	cacattggaa	gttgagcag	ggaaatgatg	ggatttatgt	145500
tttgtttttg	ttttatgttt	agtgttttta	agggattgct	ctatcagcta	tttggaattt	145560
ttagtgtagg	gttccaaaga	gagaaagaga	gaacaaacat	ttttgccaata	gtcatagtct	145620
aagttaaggga	tgtgtgtggt	gtggattagg	ctggtagtgg	aagaccagtc	cagttcgggt	145680
tgtatttgaa	ggtagaggca	aaaagattat	attttotacca	gcaagcccat	ctatgaagtt	145740
acttgtatta	ttaatttaatt	tgagacatgc	ccacataaac	taataaatag	gaatttctgc	145800
agtttggtta	aacacccctg	tatatcctgg	ttcttctttt	agttgtccag	atgtctcttt	145860
aagtcaagta	ttttttggig	gtgtaggaga	ctagagattg	aatttattoa	cccaaaaggc	145920
atttgagtga	ttactatgtg	ccaggcaact	tgctgaatgc	caaggatgta	aataagaggg	145980
cgtagtctca	gtctgtttta	ctccagcttg	gttctttttt	aatgacctgc	acttgtaag	146040
catatcagtt	atcctacaga	atgtttaatc	ttctgtactt	tcctggttgt	gttattttag	146100
ttattttctc	ttccttgaca	ttctctgtaa	actggaagtt	acacctatag	tcttgatgat	146160
tctgtttaca	cattttagat	tagaacacat	cagtggttgt	ataiggtggt	tttgaaggcc	146220
ttctgttata	ttggctgtga	cattaaaatg	ttgootgaat	ggatacacat	aaaattttac	146280
agtgtttaca	ttagagatga	gaagaagag	gtgcctttta	cttttcaata	taccttttcc	146340
ttctgttttt	gaactttctt	gcctatgca	tacgttattg	cttaactcat	caactcatct	146400
cttccctctg	ggctttctgt	tgcatttgga	atgaaatcta	gcctcttttg	tgttacctgt	146460
ggatgtccct	tgttggtctc	tatcacctta	ctttgaacca	ctcctttcat	ggactgagct	146520
ctcatttgga	tatcttttat	ttcttttgct	aagtttctct	actttgagtg	ctctggaagt	146580
tgtattttca	tggctgtggc	aagccttgcc	atggctttca	tgcgaaggat	gttctctctt	146640
ctcatctcaa	tatttatctc	tcagagaggg	accttcccaa	ctccgatgat	ctaaaatcct	146700
ttgtatatac	cactctctac	caactctctc	ttttcttttc	cttttatctt	tttttttttt	146760
tttttttttt	gagatagggg	cttgctctgt	tgccaggctc	ggaatcacga	ctcactgcag	146820
ctcatctctc	ttgggctcaa	atgatctctc	caactcagcc	tctcgagtag	ctggaactgc	146880
aggcacacac	caccatactt	ggcttattat	tttacttttt	gtagagacag	ggtttcacca	146940
aggctggtct	caagctcctg	ccgaagcaa	tcacatctct	tcagctctcc	aaagtattgg	147000
gatttatagg	gtgagccact	actctggccc	tattttctta	tctactgtct	aaaatttatc	147060
tgttctctta	tttcaatact	tgtttatagc	ttatttctca	gttggaactg	gtgctctaca	147120
ccgtgaaatc	caatactttg	ggaggctggg	ttggaagatt	ggltgagccc	aggacttcaa	147180
gaccagcctg	ggcaacaaa	tgagaccctg	tctataaaaa	attgtttaaa	aattagctgg	147240
gcatgtgtgg	ccntgctctg	ggtccagctc	acttgaggag	cagaggtggg	agantcgttt	147300
ggccccagga	ggttgaggcg	acggtgagcc	atgattgtgc	cactgcactc	tagcctagtg	147360
acagagtgag	acctgtgttc	taaaaagtaa	ataaaaatag	tttctcttct	atgactagaa	147420

-continued

tattacctct	atgtgggcag	ggagtgtgtc	tatactattt	ggcactatat	ttctgattc	147480
tgaatttatg	cctagacacat	ggtaagtaact	ccclaaatat	ttattgactg	aattatttaa	147540
tactttaagaa	tttcatcttgg	gattatctga	gtggtaagat	tacggattat	atttatgtaa	147600
gaaaaaatca	ttttttaaac	ttggttgccc	tttgccacac	tgacatagac	actaagtttt	147660
cttagccaga	ttacttccga	ggatactcac	agaggccatt	ctcttctcaa	tcoccaaata	147720
attgatattt	cttagcactt	tcaagctaata	gcaattctta	gatgatgtat	ctgtgtatat	147780
catatctcca	ttctacaaat	gtagaaattg	aagtctgggc	acagtggctc	tcacctgtaa	147840
tctcagcagt	ttggggagcc	aaggcgagcg	gatcaactgag	gacaagagtt	aagaccagcc	147900
tggccaacat	ggtaaagcct	tgcctctatt	aaaaatacaa	caattagggc	cgggcgtggt	147960
ggctcacgcc	tataatccca	gcaogttggg	aggccaaaggc	aggcagatca	cagggtcagg	148020
agttcgagac	catctctgct	aacacagtga	aaccocatct	ctactaaaaa	tacaaaaaat	148080
tagccaggca	tggttggcaag	cgtctgtagt	ccagctctat	gggaggctga	ggcaggtgaa	148140
tccttgaac	ccggggaggcg	gaggttgcaa	tgagctgaga	tggcacogct	gaactccago	148200
ctggtcacca	gaggggagact	ctgtctcaaaa	aaaaaaaaaa	aaaaacaatt	agccaggcgt	148260
ggtggcgggt	acaggtacct	gtaatcccag	ctactgggga	ggctgaggga	ggagaatccc	148320
ttaaacccag	gaggtggagt	ttgcagcggg	ctgataaatgc	accactacat	tcacgcctgg	148380
gcacacaggt	gagactctgt	cttaaaaaaa	aaaaaaagaa	agaaagaaat	tgaggaaatgt	148440
ggagatlglg	gtcgtgtgatt	tgltaggaal	cacacagcag	gttagtagca	actacagggo	148500
tttgggtccag	aataccacct	tgacaatggg	ttgtttacag	ttgggtcccc	cttccctctg	148560
ctttctctcc	ttccttattg	agggcagctg	gaagaatttt	tcactattta	ctagccatata	148620
gccttaattt	gagttttgaa	accttgataa	tagagccacag	aggaaaagac	tgagttttct	148680
ttttttgaga	cagtccttct	ctatggccca	ggctggagtg	cagtgacacc	atctcagctg	148740
gttgcaacct	ctgctctcca	ggttcaagca	attctgcctc	agcctctcga	gtagctgaga	148800
ttacaggcac	gtgtccaccac	gccacagtaa	ttttctgttt	ttgtttcgtt	ttgttttttt	148860
ctgagatgga	gtcttctctc	gtcccccagg	ctggagtgcga	gtggtgcgat	gttggctccc	148920
tczaacctct	gtctcctggg	ttcaagcaat	tcttatgcct	ccgcctcccc	agtagctggg	148980
actacaggta	cgtgccacca	tcctagtctc	atttttgtat	gtttagtaga	gatgggtttt	149040
cactatgttg	ccaggcctgg	tctcgaaact	ctgatctcag	gtgatctact	cgtctcagtt	149100
tcocaaagtg	ctgggattat	tggcacacgc	ctatttttgt	atttttagta	gagacggggg	149160
ttacaccatg	tggtttagact	ggtctcaaac	ttctgacctc	aagtgtattg	ccgcgccacg	149220
ccloccaaag	tgclgggatt	acaggcgltg	gccacogtgc	ccagccaaaga	ttgagttttg	149280
aaaagagcct	tctgagatta	tgagaagggc	aagcaagata	acttaagaag	ttacattaaa	149340
atcatctaa	agacagtgta	acaagaaggga	attgtaaaaa	gatgttatga	gcacgtgccc	149400
aalgtaglgg	caalcccttg	tgcltggata	callgggtggg	agacaaaact	gtactlaaal	149460
tgataaatcc	cttacatgtc	atttttaagg	gcttagactg	actcccatca	tgtagacatc	149520
agagattttc	tttttttttt	tttttttttt	tttttttttt	tttgtgacag	agttttgtct	149580
ttgttgccga	ggctggagtg	caatggcggt	atctcggctc	accacacact	ccacctccca	149640
ggttcaagca	attctcctgc	ctcagcctcc	cgaagtgcgt	ggattacagc	catgcaccac	149700

-continued

cacgcctggc taatttttga ttttttagtag agacgggggt tctccatgtt gtggctggtc 149760
 tcgaactcct gacctcaggt gatcctcccg cctcagccac ccaaagttct gaaattacag 149820
 gogtgagcca cgcgcgcag ccacagagatt tctaacacaga gttctaacca gatgotttct 149880
 cctgtcagta gaattgagaat gaattggagg tgggagagac tggcatgagg gacccagtc 149940
 agccagtgga attagctggt aatgttgata ggagaagaaa aagattcaaa gttaggtagt 150000
 ggtagcaaga attagagggg aggtcgggatt tatgatattgt ccaaggttga attctaaggt 150060
 gaaatttggt ggtagatttc atgtgttaaat tgggaaggtg gattgagttt ttttaacctg 150120
 ggttttttaa catgtcaata gagtgaattct gcaggggggc ctgacgagag aacagtgcat 150180
 ggggtgatcc aacagccagt tgagccttca tgcagagcat ttaacactgt gactctgtag 150240
 accttggttg gcagtaaaat ttcattaaac caatatattaa acccttaggt aataataaaa 150300
 attgagggaa aaggatccag gttttgtatt ttttatgaat tcagttattg aattaaacag 150360
 gacottgoot caagaaataa tctaccaaca attaacttgt ttaaaagcaa agttaggaa 150420
 tgagcatgtt caaattatta aataaaaaag taagctgtgt atttcattca tagaatalga 150480
 ggctggccta cttcggatga ttctcagcat gtgattacag atgtgggctt atacatcta 150540
 gggagttaag gcgtactctg gcttggtatg agtagagctc ttgnaactc ttctctcacc 150600
 cagctagttt atatagacta gagaactaga atgtagcagc atactctgtc ttagaagccc 150660
 ttttatatag gagctggtct ggaagggttg aaacataac aaatgtgttg gtgtctccca 150720
 atgtattgct agattcttac ccaagagcat tatcctgggt aggggttggt ttggttttgt 150780
 tttgtttttt aatgtttgac acaaaactaac actagatgtt agttcttca tcaagtggag 150840
 agagtagaag aanaagccag aactctgaaa cactttttca aaagttttc aagccatgat 150900
 gtttgcaagt taattgctct gttatgtaag caatataatc agtttttatt aatgtaacat 150960
 tccttagtgt tttggggtat cacacaaaaa agaatatcca tatctggaa 151020
 taatatagag catgtgggtg gtggtgggtg tagtggtttt tttttttttt ttgagtttg 151080
 agtctcgtc tggttgccag gttggagtgc agtggcacga tctcagctcg cttcaacctc 151140
 tgcctccagg ttcaagcaat tctctgcct cagcctcctg agtagctggg attataggca 151200
 cctgctaaca tgcctggctg atttttatta ttttagtaga gacagggttc acctgtttg 151260
 ccaggctggt cttgaactct taacctcagg tgaatcaccc acctggcct ccaaaagtgc 151320
 tggaaattca ggcattgaac accattggcc gccaaataag agcattttta atgtaaaatt 151380
 atgatgaaa tgtacattca attttgtctt tgtttactag gatccatgtt ctcaacaagt 151440
 atgaagaaat ggggtcaagg aaatactgat gaggtaaatc ctacccttag gataaaaaga 151500
 tttctgttta taagtgccac cctcatgtaa gtgaggttta aaattttct tttctttagg 151560
 tcccatgttt aagcagcatg gcacatttat gttctcttac ccagaatgta ccaagaaagg 151620
 gtggctcctt cttaacatct aacaaattgc tggtagtagc agtgaaaggtt tcttcagtc 151680
 gaggctagga ccactgaagg atatacatgc attcaagttt ccactagcca gcaggcatca 151740
 gtaatcagtg tgtagatcaa aagctcaaat gtttcccttc ccactggcag ttttacttca 151800
 agtagtgtag gcttgctttt ttaatatgta attaatgaca ttgagagatg ggaaggtgaa 151860
 aaaggaaaaa gttttttttt gacctctaa tatgaaagta gttcgggtgt aggtatocag 151920
 tagttgacac tggaagacag ggaatgacat gttaatatc atagccagag ggtggccac 151980

-continued

gttttttcgt	acatgggaat	gaaattotta	tccaaataag	tagaatttat	gtgcgtaago	152040
cattlgttaa	gagcactlgag	latlgtgcac	tcgalccatc	taatgaataa	ccattatcac	152100
cagtttaaat	tattttcttt	aggcccagga	agagctagct	tggaagattg	ctaaaatgat	152160
agtcagtgan	attatgcagc	aggctcagta	tgatcaaccg	ttagagaaat	ctacaaaggt	152220
aaggatgact	tcgtttltgig	taaaactaaaa	aglatatttt	tccagggtga	aaaaataaaa	152280
agaacataag	gggtttcttt	gcctttgaag	gattaactgc	tgtggggatt	accttcttat	152340
cataagcaac	taganaattg	acaaactaaa	tgaacaaact	gtttgcata	attggacaa	152400
gggcataaca	gggaaccat	ggaacccaaa	cagagcccag	tagtcttgct	gaacgaaga	152460
gttaaatatc	aaagttcagg	ccagggtgcag	tggctcacgc	ctgtaatccc	agcactttgg	152520
gaggccaagg	cggttgaaic	acttgaggto	aggagttcaa	gaaccagcctg	gccaacatgy	152580
tgaaacccctg	tcttagccgg	gtgtgtgtgg	aggcacctgt	aatcccaact	atttgggagg	152640
ctgaggcagg	agaatgcctt	gaaccaggga	ggcggaggtt	gcagtgcagc	gagatcacac	152700
cactgcacac	cagcctgggc	gacgagcgaa	accccaattc	aaaaaaaaa	tcaaagttca	152760
gagagctcaa	tttgagtaga	agttgtagga	taaggtagca	gaaaaagga	agctgccag	152820
aaagaaagcc	gtgagagat	ttagagagat	tccactggat	ccttggccta	ggagtgatct	152880
gtatatgtgt	gggttgaaaa	cgcattgtgt	caggtagaga	acccccaga	aattagtagg	152940
ctgaatgatt	gctggaacat	agggctaaga	aaagtctatg	gccagaagga	tctggccaga	153000
gtagagagac	ttaglaatac	acaaggcaat	gggtagtgto	ttcacagagg	ttatgcctta	153060
ctactgaaga	taaatattgtc	ctagagtaca	agcacctgaa	ccaagtttca	aagcaatttt	153120
ttaaagggtc	aaattaccta	acaactgcct	gccaaaacaa	aggcctaacc	ctctttacag	153180
taacacacaa	aaattcagca	cttcacagtg	taaagttaga	atgtctgacg	tccaggctgy	153240
gcgcagtggc	tcatgcctgt	aatccacaga	ctttgggagg	ccgaggcagg	tagatgacct	153300
gaggtcagga	gttcaagacc	agcctggcta	acatggtgca	accccgctct	tattaaaaat	153360
acaaaaactt	agccaggcat	ggtggccggc	acctgtgato	cggctactct	gggaggctga	153420
ggcaggagaa	ttgcctgaac	ccaggagggtg	aaggttgccg	tgcgcagaga	tgcacaaact	153480
gcactctggt	ctgggcacaa	agagcaaaac	tcaggctcaa	aaaaaaaaa	gaatgtctga	153540
cgtcaatcac	aaattaccac	gcctgacatg	aagttgacct	ataaccagga	gaaaactcaa	153600
tctatagaaa	cagaccagga	tgtgagaag	atgatgaatt	tagcagacaa	agaccatcaa	153660
gtggctattt	taaatattaa	aaatatgttc	aagtgccag	gtgcagtggc	tcatgcctgt	153720
aatccacaga	ctttgggagg	ccaagggtgg	taggagttca	agaccagctt	ggccaatatg	153780
gtgaaccccc	ttctctacta	aaaatacaaa	aaaattagct	gggcattggtg	gcaggltgct	153840
atagtccag	ctatatggga	ggctgaggca	caagaatcac	ttgaacccgg	gaggtggagg	153900
ttgaggttgc	agtaagccga	gattgtgcca	cttgtactcc	agcctggaca	acagagtgag	153960
actctgtctc	aaaaaaaaa	aaaaaaaaag	taaaagaaaa	aagagtalaa	tgaagaaaa	154020
gcaaaatagt	tttaaaagaa	ccaaatggaa	tttcttaaaa	taaaaaatac	cagaanaatgg	154080
ggccggggcgt	ggtagctcac	gtctataatc	ccaggaacttt	gtggggggcgt	aggcaggcag	154140
atcacctgag	atcggttagt	caaggccagc	ctgaccaaca	tggagaaaa	tcactctcac	154200
taaaaataca	aaattagctg	ggcgtggtgg	cgcattgctc	gtaatccacg	ctacttggga	154260

-continued

```

ggctgaggca ggagaattgc ttgaacccgg gaggcagagg ttgcggtgag ctgagattgc 154320
accagtgcac tccagcttgg gccacaagag tgaaactccg tctcaaaaaa aaaacaaaaa 154380
aaaacagtag actcgaaaga ctagctgagt ttttctttac tttaggcagt aagtgtagcc 154440
ttttgcaggt gactacttta gttcctcatg tctccttag tagatcagag aattcgaca 154500
ccaaaacccc aaaagaaaaa ccccttctaa tctcattcc atgattttat gaatgcata 154560
agtcttaggc ctgcgaagga atactcattc tctttatcct gtgttgatac ctctctgctt 154620
caacctcaaa ctcgacattt gactatagga tgcacttggg cactcagcat aaactaacct 154680
acaccattac tgaattgctt catgtgcaca tgcacctgc cacaatccg gggaccttgt 154740
cttcctgat atttgtccgc agtgctgtga ctacaggagg gagtcaatga atgtctgcat 154800
gtgtgtcttt accatccctc ttgaatatgc tctagggtta attcctagaa gtagaattac 154860
tctattgaaa attggcaata tttttcattc taatatctat tgccaacatg ggaagcaag 154920
tctggatgca agtctctgtt atatgacctt tgggtaagtt acgtaaacct ttttaagctc 154980
tgttcactca tattttaaca aggaaaaatta caatatatta cctcacaata ttgtagtcag 155040
ctctgtgctg tcttaaaactc tggatatag taacacactaa gtgttggtgt ccatccttaa 155100
tttgtataaa taggtcaactt gttagagana tgcaacctac cattttcttt tctttcttt 155160
tttcagttat gactcaaaac ttgagataaa ggaactctgc ttgtgaaaaa taagagaact 155220
tttttccctt ggttggtattc ttcaacacag ccaatgaaaa cagcactata tttctgact 155280
gtcactgttg tttccaggag agaalgagg acaactcctag acttccacca taatgcagtt 155340
acctgttagc ataattgatg cacatgatgt tcacacagtg agagctttaa agatacaaaa 155400
tggtattggt tacattacta gaaattattt agttttccaa tggcaataac cattttatga 155460
gagtgtttta gctacttggg atagacaggg accacatcct ctgggaagca gataagcata 155520
gaactgatac ttgatgcaca ctctagtggg taactcatcc ctaatcagca ttgtaaagca 155580
ggtgcagag gtggttttgt ttgtccttcc aaagcagggt agtcagcccc accgagagcc 155640
aggcagcttt gagtggcagc gtggtgctag cagcttcagc ggaacagggt gagagttaat 155700
tatgcagctc tcttgacagc ggcattcaatt ttggaaggaa ctgacaagtc atgggtcaag 155760
tttcagtgac ttctccttcc ctctgatggc agtatatagt tttaacattt taattcctcc 155820
tcttgagatg cactataactt aaaaccattc tctccctgc taacagaagg gtgtgaactc 155880
ggtttacttt gagcattagg atttgccctt ttggaattct gcactccagt tacttaactt 155940
tcccttcaga atacatgtgg aaagaaagaa agaaatagcg atgaactcac ttttgccct 156000
gtggcacctt gaacaaagca gttcttccca aattataactt tttttttttt taaataaggt 156060
gagcaggatg aotggggaga gagaacattt tgaactttgac tgccctcccc attcttttgt 156120
gtgagctggg aagtgtagcag ttggtcgtct tctctctcct tcttttagga tagtaagaga 156180
ctcaactcaat gcaactctgc ctagtggctc tctgactcgg gatcacacag ccatcagcag 156240
gactgccag ttggtagca cactccattg accaagcggc gccagcgctt cclcaatgca 156300
catgattgag aggaaagaaa gttctcttag atgttaactgc ttttgctcag actttgcaaa 156360
aaaaaaaaata tatatatata tgtataaata tataattatt aatcaacttt gtctctgaga 156420
aagtccttga tgacagagga atttattcca ttgcaatatt tgattgtata gaggcacact 156480
gtttcatcga cagaagaagc aaaaaggctt tgtgttaagtt ttgggtacta tgtaccacct 156540

```

-continued

ctgtttattct	tttaaagctg	aagtattcat	gtacttaaac	catattatat	ttaattgtgt	156600
ttgatttttaa	aalatatata	latgaaltct	atttaaaatt	gigtaactt	lotgttllca	156660
gggcattttat	ggctctctcg	ttgaaatata	ttgatcttto	caaataattt	catttgcttt	156720
ctaaaaaccc	agAACatgag	ccaactactg	actttgcctt	gtgtttgaag	tgtatggcat	156780
aaacccaagg	tttttattag	tcactctatgc	tgtgattaat	tcattttglt	cttttaacaa	156840
aatattttcca	tcactttcac	attgcttcaa	tctttaacag	aaaagcaata	taaaggttat	156900
agaataaaat	gtggttttgg	gaaactottg	ctgctctctg	atgttttgga	ataaacaattt	156960
ctacaagact	ctaggctggt	taaacatagtg	ctttcagtta	agataaaatc	taatcatcttc	157020
tttgtatata	cattttgtgc	ttctgagcta	gagatgcca	gtagtgttaa	actgcttata	157080
aagagaatag	cagcaaatit	gagactoggc	tacttttttc	tgccccacct	gctttgagac	157140
acagaagcgg	agtgctggcc	gaattattata	gocagattta	atatttgatc	taaagtaggt	157200
ccttgtaactc	atttttaaagt	tggaaattga	ttctcccaac	attgagocac	caccatgttc	157260
caggctctgt	gcaattgtgc	cacaaaaata	gattcccttg	tggagttttt	atgggtlcaa	157320
ataatcagtt	gaacacccctt	catctttatc	atgtttgtga	cattgacaca	aattgtttaa	157380
aaagaaagaa	tatttagagag	aaagtggta	ctttgttaact	tgaatgtctc	tcactatttc	157440
gtaagatttg	atgaagataa	aaagcaaatg	tcagccaaat	ccagtgaaca	gcaataaaaa	157500
agggagttaac	tttttataac	tttttctact	tggatttcaa	cattcagtag	agcttttcga	157560
aatgtaagta	glttacagla	ctggagggtt	gactagtcca	giagggaatt	ggaggggaag	157620
gtcattctga	attgtaacaa	agtacaaact	tctttgctgt	tttattttaag	tactgagago	157680
taagcacctg	atgaagtga	tgaactctct	ccagtgaacg	tgtttgggta	cctgectgac	157740
ttcaggagtg	gggtttatgt	ttctacacag	tgaacttttc	tctcgccctc	tcctccctct	157800
tgcccacaca	ccagttgatt	ggacctgggt	tgaactcctg	atccagacag	gcccaagaca	157860
gttcttaaatg	ttaagaattt	tggggccggg	cacggtggct	catgctctga	attgcaaac	157920
tttggggaggo	cgagacaggo	ggatcaactg	aggtcagggg	ttcgaggcca	gcttgggcca	157980
catggtgaaa	ccctgtcttt	actaaaaata	caaaaattag	ctgggcattg	tggcgccgcg	158040
ctgtaatccc	agctaactgg	gtgctgaga	caggggaatc	gcttgaaact	ggaggcggag	158100
gttgtgtcaat	gagccgagac	cgtgtcaact	catccagcc	tgggtgacag	aggagagact	158160
tgtctccaaa	ataaaaaata	agaaaaagaa	ttttgggcta	ggtgcagtg	ctccgcctg	158220
taattacagc	attttggaa	gcccagatg	ggcagatcac	ttgaggacag	gagttcgaga	158280
ccagcctgga	caacatgggt	aaactccatc	tctactaaaa	agacaaaagt	tagccagatg	158340
tgggtgatgg	caactataat	cctagctcct	cgaggggctg	gggcaggaga	atcactlgaa	158400
ccagggaagc	agagattgca	gtgagccaag	atcacatctc	tgcactccag	cctggggcaac	158460
agagcagac	tctgtctcaa	aaaaaaagaa	atttggccag	gcgcagtgg	tcacgcctgt	158520
aalccagaca	clttgggagg	ccaaggcagg	cagaloacga	ggloaggaga	tcgagallgl	158580
cctgggtaac	atgggtgaac	cctgtctcta	ctaaaaatac	aaaacattag	ccgggtgttg	158640
tgggtggcac	ctgtagtccc	agctactagg	gaggctgagg	cagagggaag	atgtgaaccc	158700
aggaggcggg	gcttgagcta	agccaagatc	gtgccactgc	actacagtct	gggcagacga	158760
gtgagactcc	gtctcaaaaa	aaaaaagaat	tttggccggg	tgcggtggca	catgctctga	158820

-continued

```

gtccagcagc tttgggagac caaagtgggc ggattacctg aggtcaggag ttcaagacca 158880
glccggccaa tatggcgaaa cccgtctctt tactaaaaaa aatacaaaaa tttagccagg 158940
gtggtggcgg gcacctgggg aggcctgaggc agggagaaat gcttgaaccg gggaggcgag 159000
ggttgcagta agccaagatc gtgccaactgc actccagagc aagactcttt ctcacaaaaa 159060
aaaaaaaaag aatttlgcat ggggaaggag agataactgtl caccatctgg aatggtgctt 159120
ggatgtggca cttacaaaaat caggagccag cactgcctgg acaaacagaa gcctatgggc 159180
ctgagatagc aggtacacctg ataacacctg agacatctct ggtttctgca tctattctct 159240
cctccttgca ttggactaca ttaactctgtc agttatctct ataagtattt ttgatttttt 159300
ttttttgaga tggagtttcg ctcttggttc ccagggtgga gtgcaatggc acgatctcgg 159360
ctcaccacaa cctccacctc ccagggtcaa gtgattctgc tgcctcagcc tctgaglaa 159420
ctgggattac aggcctgcgc caccacacct ggctaatttt gtatttttag tagagacggg 159480
gtttctccat gttggtcagg ctggtctcga actcccaacc tcaggtgata acctgtctc 159540
ggcctcccaa agtgcgggga ttacaggcgt aagcctatgtl accgggtcgt ttttttgatt 159600
ttttgaaacc agtctgaagt gagttttttt aattacgtga aaggagtttg gctaaaaaac 159660
tgcatactgc ccttaactgc taatgattat gtattctcag catgtctgca aagtactgct 159720
gatttctgga gaataatttt tctttagtaa acttcaacta agtcgtcatg tgtattctct 159780
caaatggata tcttaacctc atggagctaa aagacacccc ttgtttttat aacaagcagt 159840
tactgaggcc caggaaaggg agaaglcctt ggcctgtgag atgacacca ttagaaccta 159900
ggcctgggcc agtgcttttt catgctcttc agatccttcc aaagaataat gaagattata 159960
accgctttta gcaattgtaa taaccacaga aatagaaagc tttttggta gagtactggt 160020
agaagttttg cgggagagat aattlltaca aaatttgtaa atacctgcca attctatata 160080
ctaggcaagg tctctggcct tgtaaaaccc ctcaaggtta caacttgggt ggccacact 160140
aatagttacc cactgaggcc ctctccgggt gaacattgag caatagagga agccctctg 160200
cttgggcagg actggcgctg gtgcagagta ggaagcggtga tactgtggat tctgggcagg 160260
ttggagatggc cagtgtatgc caataaagga cactggaggg agcagtgtga gtaaaaggcc 160320
tgaggggcatt catgttccgg gagggctgct gcccaactggc ttgcttgga caccggagag 160380
tgggtattcc tgccttagta actttatgta aacaagtatt tctcagctct gttcctctca 160440
aactgcctgc tctggccact tcagaatgtc acagaactca cctggatgca ttacggccct 160500
tgccataaagg tgacagtga tctccttccc caccaccccc ctcataccac tgaagcact 160560
gtcagactgg cccagctctgt gggcaaggag cctagagagg gcttagtttc agcttgaag 160620
gagctgggat ttaccaagaa gcaaalgaga gacgaggatl gcaacaactg tgccatttcc 160680
ccagcttcag ctgactcctg tatattgact gtgccttcag actcatccgt aagtgacccc 160740
aggttggtct ctcacacatc acagtaagaa ttccacacac catcaactt ggaagaggcg 160800
tccagctgaa ggaagcccca cactlcltcc aaglltltcl tagtcttcl tctctggcaa 160860
agagtacctt ttgtttcttc taattatgta actattgggt tagtaaatat tcaccactc 160920
agtcacacctg taagtggcag gcaactgtta cagggaacca ggaagganta aaaaactgca 160980
ggcaccttgg agcttgcaat ctattgaaga ggtaatggaa gttgggatat cagctaaact 161040
atgtcgttat tggccaggcg cagtgcctca cactgtaat cccagcactt tggaggccaa 161100

```

-continued

```

ggtgggcaga tcattgaagtc agggagatcga gaccatcctg gctaacatgg tgaaccccg 161160
tcctactaaa aagtaaaaaa aaaaalttagc cagggtgltgt ggcgggcgcg tglagtcga 161220
gctaacttggg aggctgagggc agggagaatgg tgtgaaccca ggaggcgaag attgcagtga 161280
gcgagatggg caccactgca ctccagcctg ggtgacagag cgagactctg tctcagaaaa 161340
aaaaaataatg ctggtagtitt tgattcaaga tggcctttgg agcccatgat ttaggtctcg 161400
taccaccacaa ggtctactgg aaaacatcag gctctcctgc tatagacca tagggagagc 161460
tgcagccgag agggggagct gaagagaagt gccctctctg tgtcctgtoa gctcctcct 161520
tcgcgaagga ccagttgctg tgcactcca ttcaattgct gcaagactgg aggtttttcc 161580
tcaggtgttg agcacctggt ttacaagatg tcagcatctt gatgcctgag accatcaagg 161640
caagtctctg aacaggggctt accttagagt aaggcttaga agaggccgta aagtcagttc 161700
cagctccctg gctctgcaga gctttgggac atgtgaattc ttaaaaaaa gactattgta 161760
cagttactat atgcatgcag tataaaatta taaccttgga aaactctagc tagctgttga 161820
gctaattcca taaaglaatc agctcctgag ttctgcagtg gtaataataa tcagcataat 161880
gagtaaacac tgtgtgtgcc aggcagctgc tcatttgatc cttgtgataa tcttgtaagt 161940
actgattttc tccctctctt aacaaagtt tttttttttt ttttagagag ggtctcacta 162000
tgttgccag gctagctctg aattc 162025

```

```

<210> SEQ ID NO 37
<211> LENGTH: 1350
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<220> FEATURE:
<221> NAME/KEY: CDS
<222> LOCATION: (213)...(920)
<300> PUBLICATION INFORMATION:
<308> DATABASE ACCESSION NUMBER: GenBank AJ242973
<309> DATABASE ENTRY DATE: 1999-10-26

```

```

<400> SEQUENCE: 37
gggcgcgcgt cgacgtgaca gccggtacgc cggggtttgg gcaacctcga ttacgggcgg 60
ctccaggcc cgcacagcgc gccccgcgcc gccgcgcgc gccctgcgc ccccccggtt 120
cgggcgcggy accccactct ctgcagttcc ggtgcgggtt cagctgcagg tagcgcctg 180
ccccgggacc acccttcggc tggcgccctc cc atg ctc tgc gcc acc cgg agg 233
Met Leu Ser Ala Thr Arg Arg
1 5
gct tgc cag ctc ctc ctc ctc cac agc ctc ttt ccc gtc ccg agg atg 281
Ala Cys Gln Leu Leu Leu Leu His Ser Leu Phe Pro Val Pro Arg Met
10 15 20
ggc aac tgc gcc tgc aac atc gtc agc ccc cag gag gcc ttg ccg gcc 329
Gly Asn Ser Ala Ser Asn Ile Val Ser Pro Gln Glu Ala Leu Pro Gly
25 30 35
cgg aag gaa cag acc cct gta gcg gcc aaa cat cat gtc aat gcc aac 377
Arg Lys Glu Gln Thr Pro Val Ala Ala Lys His His Val Asn Gly Asn
40 45 50 55
aga aca gtc gaa cct ttc cca gag gga aca cag atg gct gta ttt gga 425
Arg Thr Val Glu Pro Phe Pro Glu Gly Thr Gln Met Ala Val Phe Gly
60 65 70
atg gga tgt ttc tgg gga gct gaa agg aaa ttc tgg gtc ttg aaa gga 473
Met Gly Cys Phe Trp Gly Ala Glu Arg Lys Phe Trp Val Leu Lys Gly
75 80 85

```

-continued

gtg tat tca act caa gtt ggt ttt gca gga ggc tat act tca aat cct	521
Val Tyr Ser Thr Gln Val Gly Phe Ala Gly Gly Tyr Thr Ser Asn Pro	
90 95 100	
act tat aaa gaa gtc tgc tca gaa aaa act ggc cat gca gaa gtc gtc	569
Thr Tyr Lys Glu Val Cys Ser Glu Lys Thr Gly His Ala Glu Val Val	
105 110 115	
cga gtg gtg tac cag cca gaa cac atg agt ttt gag gaa ctg ctg aag	617
Arg Val Val Tyr Gln Pro Glu His Met Ser Phe Glu Glu Leu Leu Lys	
120 125 130 135	
gtc ttc tgg gag aat cac gac ccg acc csa ggt atg cgc cag ggg aac	665
Val Phe Trp Glu Asn His Asp Pro Thr Gln Gly Met Arg Gln Gly Asn	
140 145 150	
gac cat ggc act cag tac cgc tcg gcc atc tac ccg acc tct gcc aag	713
Asp His Gly Thr Gln Tyr Arg Ser Ala Ile Tyr Pro Thr Ser Ala Lys	
155 160 165	
caa atg gag gca gcc ctg agc tcc aaa gag aac tac caa aag gtt ctt	761
Gln Met Glu Ala Ala Leu Ser Ser Lys Glu Asn Tyr Gln Lys Val Leu	
170 175 180	
tca gag cac ggc ttc ggc ccc atc act acc gac atc cgg gag gga cag	809
Ser Glu His Gly Phe Gly Pro Ile Thr Thr Asp Ile Arg Glu Gly Gln	
185 190 195	
act ttc tac tat gcg gaa gac tac cac cag cag tac ctg agc aag aac	857
Thr Phe Tyr Tyr Ala Glu Asp Tyr His Gln Gln Tyr Leu Ser Lys Asn	
200 205 210 215	
ccc aat ggc tac tgc ggc ctt ggg ggc acc ggc gtg tcc tgc cca gtg	905
Pro Asn Gly Tyr Cys Gly Leu Gly Gly Thr Gly Val Ser Cys Pro Val	
220 225 230	
ggt att aaa aaa taa ttgctcccca catggtgggc ctttgaggtt ccagtaaaaa	960
Gly Ile Lys Lys *	
235	
tgctttcaac aaattgggca atgcttgtgt gattcacaaat cgtggcattt aaagtgcaca	1020
aagtacaaag gaattttatc agattggggtt taccgaagta taatctatag gaggcgcgat	1080
ggcaagttga taaaatgtga cttatctcct aataagttat ggtgggagtg gagctgtgcg	1140
gtttcctgtg tcttctgtggg tctgagtgaa gatagcaggg atgctgtgtt cacccttctt	1200
ggtagaagct aaggtgtgag ctgggaggtt gctggacagg atgggggacc ccagaagtcc	1260
tttatctgtg ctctctgcc gccagtgcct tacaatttgc aaacgtgtat agcctcagtg	1320
actcattgcg tgaaatcctt cgctttacca	1380
<210> SEQ ID NO 38	
<211> LENGTH: 235	
<212> TYPE: PRN	
<213> ORGANISM: Homo Sapien	
<400> SEQUENCE: 38	
Met Leu Ser Ala Thr Arg Arg Ala Cys Gln Leu Leu Leu Leu His Ser	
1 5 10 15	
Leu Phe Pro Val Pro Arg Met Gly Asn Ser Ala Ser Asn Ile Val Ser	
20 25 30	
Pro Gln Glu Ala Leu Pro Gly Arg Lys Glu Gln Thr Pro Val Ala Ala	
35 40 45	
Lys His His Val Asn Gly Asn Arg Thr Val Glu Pro Phe Pro Glu Gly	
50 55 60	
Thr Gln Met Ala Val Phe Gly Met Gly Cys Phe Trp Gly Ala Glu Arg	
65 70 75 80	

-continued

Lys Phe Trp Val Leu Lys Gly Val Tyr Ser Thr Gln Val Gly Phe Ala
 85 90 95
 Gly Gly Tyr Thr Ser Asn Pro Thr Tyr Lys Glu Val Cys Ser Glu Lys
 100 105 110
 Thr Gly His Ala Glu Val Val Arg Val Val Tyr Gln Pro Glu His Met
 115 120 125
 Ser Phe Glu Glu Leu Leu Lys Val Phe Trp Glu Asn His Asp Pro Thr
 130 135 140
 Gln Gly Met Arg Gln Gly Asn Asp His Gly Thr Gln Tyr Arg Ser Ala
 145 150 155 160
 Ile Tyr Pro Thr Ser Ala Lys Gln Met Glu Ala Ala Leu Ser Ser Lys
 165 170 175
 Glu Asn Tyr Gln Lys Val Leu Ser Glu His Gly Phe Gly Pro Ile Thr
 180 185 190
 Thr Asp Ile Arg Glu Gly Gln Thr Phe Tyr Tyr Ala Glu Asp Tyr His
 195 200 205
 Gln Gln Tyr Leu Ser Lys Asn Pro Asn Gly Tyr Cys Gly Leu Gly Gly
 210 215 220
 Thr Gly Val Ser Cys Pro Val Gly Ile Lys Lys
 225 230 235

<210> SEQ ID NO 39
 <211> LENGTH: 481
 <212> TYPE: DNA
 <213> ORGANISM: Homo Sapien
 <300> PUBLICATION INFORMATION:
 <308> DATABASE ACCESSION NUMBER: GenBank AW195104
 <309> DATABASE ENTRY DATE: 1999-11-29

<400> SEQUENCE: 39

ggcattatttg gactgtaggt ttttattaaa acaaacattt ctcatagctc taagcaaaagc 60
 attagaattc atcaagcgga ctcacatctt ttctctgcac agagaggggc tgaaaaggga 120
 gagaaagtcc cttatgtatg tctagatttg gtaaaagcga ggatttcagc gaatgagtca 180
 ctgaggctat acacgcttgc aaattgtaag gcactggcgg gcagagagca cagataaagg 240
 acttctgggg tcccccatcc tgtccagcaa cctcccaagct cacaccttag cttctaccaa 300
 gaagggtgaa cacagcatcc ctgctatctt cactcaagacc ccagaaaaacc cagggaaaacc 360
 cgacagctcc actccaccca taacttatta ggagataagt cacattttat caacttgcca 420
 tcgcgcctcc tatagattat acttcggtaa acccaatctg tataaattcc ttgtacttt 480
 g 481

<210> SEQ ID NO 40
 <211> LENGTH: 390
 <212> TYPE: DNA
 <213> ORGANISM: Homo Sapien
 <300> PUBLICATION INFORMATION:
 <308> DATABASE ACCESSION NUMBER: GenBank AW874187
 <309> DATABASE ENTRY DATE: 2000-05-22

<400> SEQUENCE: 40

ttttttttat tggactgtag gtttttatta aaacaaacat ttctcatagc tctaagcaaa 60
 gaattagaat toatcaagag gactcaacatc tttttctctg acagagaggg ctgaaaaggg 120
 agagaaagcc cttatgtat gtctagattt ggtaaagcga aggatttcag cgaatgagtc 180

-continued

actgaggcta tacacgtttg caaattgtaa ggcaatggcg ggcagagagc acagataaag 240
gaatttttggg ggtcccccatt tctgtccag caactccca gtcacacct tagcttctac 300
caagaaggggg tgaacacagc atccctgcta tcttcaacta gacccccaga agacacagga 360
aaccgcacag ctccactccc accataactt 390

<210> SEQ ID NO 41
<211> LENGTH: 43
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 41
agcggataac aattcacac agggagctag ctgggaagat tgc 43

<210> SEQ ID NO 42
<211> LENGTH: 22
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 42
gtccaatata tgcaaacagt tg 22

<210> SEQ ID NO 43
<211> LENGTH: 23
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 43
agcggataac aattcacac agg 23

<210> SEQ ID NO 44
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 44
actgagcctg ctgcataa 18

<210> SEQ ID NO 45
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 45
tctcaatcat gtgcattgag g 21

<210> SEQ ID NO 46
<211> LENGTH: 43
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

-continued

<400> SEQUENCE: 46
agcggataac aatttcacac agggataaca cagcaatcag cag 43

<210> SEQ ID NO 47
<211> LENGTH: 23
<212> TYPE: DNA
<213> ORGANISM: oligonucleotide primer

<400> SEQUENCE: 47
agcggataac aatttcacac agg 23

<210> SEQ ID NO 48
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Oligonucleotide primer

<400> SEQUENCE: 48
ctggcgccac gtggtcaa 18

<210> SEQ ID NO 49
<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 49
tttctctgca cagagagggc 20

<210> SEQ ID NO 50
<211> LENGTH: 44
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 50
agcggataac aatttcacac agggctgaaa tcttctgctt tacc 44

<210> SEQ ID NO 51
<211> LENGTH: 23
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 51
agcggataac aatttcacac agg 23

<210> SEQ ID NO 52
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 52
ctgaaaaggg agagaaaag 18

<210> SEQ ID NO 53
<211> LENGTH: 20

-continued

<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 53
tcccaaaagtg ctggaattac 20

<210> SEQ ID NO 54
<211> LENGTH: 22
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 54
gtccaatata tgcaaacagt tg 22

<210> SEQ ID NO 55
<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 55
cccacagcag ttaatccttc 20

<210> SEQ ID NO 56
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 56
gcgctcctgt cgggtgcca 18

<210> SEQ ID NO 57
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 57
gcctgactgg tgggggcc 18

<210> SEQ ID NO 58
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 58
catgcatgca cggtc 15

<210> SEQ ID NO 59
<211> LENGTH: 30
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

-continued

<400> SEQUENCE: 59
cagagagtac cactcgacag tgcctgcatg 30

<210> SEQ ID NO 60
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 60
catgcatgca cggtt 15

<210> SEQ ID NO 61
<211> LENGTH: 30
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 61
gtacgtacgt gccaaactccc catgagagac 30

<210> SEQ ID NO 62
<211> LENGTH: 14
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 62
catgcatgca cgggt 14

<210> SEQ ID NO 63
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 63
gcctgactgg tggggccc 18

<210> SEQ ID NO 64
<211> LENGTH: 26
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 64
gtcgtgcagg tgtaaaccttg taccag 26

<210> SEQ ID NO 65
<211> LENGTH: 28
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 65
cacggatccg gtagcagcgg tagagttg 28

-continued

<210> SEQ ID NO 66
<211> LENGTH: 19
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 66
actgggcatg tggagacag 19

<210> SEQ ID NO 67
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 67
gcactttctt gccatgag 18

<210> SEQ ID NO 68
<211> LENGTH: 14
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 68
tcagtcacga cggt 14

<210> SEQ ID NO 69
<211> LENGTH: 14
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 69
oggataacaa tttc 14

<210> SEQ ID NO 70
<211> LENGTH: 37
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 70
caatttcac gctggatgca atctgggcta tgagatc 37

<210> SEQ ID NO 71
<211> LENGTH: 37
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 71
caatttcaca cagcggatgc ttcttttggc tctgact 37

<210> SEQ ID NO 72
<211> LENGTH: 40

-continued

<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 72
tcagtcacga cgttggatgc caataaaagt gactctcagc 40

<210> SEQ ID NO 73
<211> LENGTH: 37
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 73
cggataacaa ttctggatgc actgggagca ttgaggc 37

<210> SEQ ID NO 74
<211> LENGTH: 38
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 74
tcagtcacga cgttggatga gcagatccct ggacaggc 38

<210> SEQ ID NO 75
<211> LENGTH: 38
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 75
cggataacaa ttctggatgg acaaaatacc tgtattcc 38

<210> SEQ ID NO 76
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 76
tcagtcacga cgttggatgc agacagctc cgagtc 36

<210> SEQ ID NO 77
<211> LENGTH: 32
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 77
cagcggatgat cattggatgc aggaagctct gg 32

<210> SEQ ID NO 78
<211> LENGTH: 38
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

-continued

<400> SEQUENCE: 78
tcagtcacga cgttgatgc ccacatgcc cccactac 38

<210> SEQ ID NO 79
<211> LENGTH: 35
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 79
cggataacaa ttccgatgc ccgtcagga ccacg 35

<210> SEQ ID NO 80
<211> LENGTH: 37
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 80
tcagtcacga cgttgatgc ccacagtga gcttcag 37

<210> SEQ ID NO 81
<211> LENGTH: 22
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 81
gctcatacct tgcaggatga cg 22

<210> SEQ ID NO 82
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 82
tcagtcacga cgttgatga ccagctgttc gtgttc 36

<210> SEQ ID NO 83
<211> LENGTH: 34
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 83
tacatggagt tcgggatgc acacggcgac tctc 34

<210> SEQ ID NO 84
<211> LENGTH: 40
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 84
tcagtcacga cgttgatgg ggaagacag agatatacgt 40

-continued

<210> SEQ ID NO 85
<211> LENGTH: 29
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 85
gaggggctga tccaggatgg gtgtccac 29

<210> SEQ ID NO 86
<211> LENGTH: 30
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 86
tgaagcactt gaaggatgag ggtgtctgcg 30

<210> SEQ ID NO 87
<211> LENGTH: 38
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 87
cggataacaa ttctggatgc tgcgtgatga tgaatcg 38

<210> SEQ ID NO 88
<211> LENGTH: 26
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 88
gatgaagctc ccaggatgcc agagga 26

<210> SEQ ID NO 89
<211> LENGTH: 27
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 89
gccgcgggtg taggatgctg ctggtgc 27

<210> SEQ ID NO 90
<211> LENGTH: 31
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Template

<400> SEQUENCE: 90
cgcagggttt cctcgtcgca ctgggcatgt g 31

<210> SEQ ID NO 91
<211> LENGTH: 43

-continued

<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Biotinylatd primer

<400> SEQUENCE: 91
tgcttatccc tgtagctacc ctgtcttggc cttagcagatc caa 43

<210> SEQ ID NO 92
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 92
agcgggataac aatttcacac aggccatcac accgagggtac tg 42

<210> SEQ ID NO 93
<211> LENGTH: 44
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 93
cccagtcacg acgttgtaaa acgtcttggc cttagcagatc caag 44

<210> SEQ ID NO 94
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 94
agcgggataac aatttcacac aggccatcac accgagggtac tg 42

<210> SEQ ID NO 95
<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 95
ctccagctgg gcaggagtgc 20

<210> SEQ ID NO 96
<211> LENGTH: 17
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 96
caacttcagtc gatccct 17

<210> SEQ ID NO 97
<211> LENGTH: 23
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Biotinylated primer

 -continued

<400> SEQUENCE: 97

cccagtcacg acgttgtaaa acg 23

<210> SEQ ID NO 98

<211> LENGTH: 100

<212> TYPE: DNA

<213> ORGANISM: Homo sapien

<400> SEQUENCE: 98

cctttgagaa agggctctgc ttgagttgta gaaagaaccg ctgcaacaat ctgggctatg 60

agatcaataa agtcagagcc aaaagaagca gcaaaatgta 100

<210> SEQ ID NO 99

<211> LENGTH: 100

<212> TYPE: DNA

<213> ORGANISM: Homo sapien

<400> SEQUENCE: 99

cctttgagaa agggctctgc ttgagttgta gaaagaaccg ctgcaacaat ctgggctatg 60

agatcagtaa agtcagagcc aaaagaagca gcaaaatgta 100

<210> SEQ ID NO 100

<211> LENGTH: 100

<212> TYPE: DNA

<213> ORGANISM: Homo sapien

<400> SEQUENCE: 100

gaattatttt tgtgtttcta aaactatggt tcccaataaa agtgactctc agcgagcctc 60

aatgctccca gtgctattca tgggcagctc tctgggctca 100

<210> SEQ ID NO 101

<211> LENGTH: 100

<212> TYPE: DNA

<213> ORGANISM: Homo sapien

<400> SEQUENCE: 101

gaattatttt tgtgtttcta aaactatggt tcccaataaa agtgactctc agcaagcctc 60

aatgctccca gtgctattca tgggcagctc tctgggctca 100

<210> SEQ ID NO 102

<211> LENGTH: 84

<212> TYPE: DNA

<213> ORGANISM: Homo sapien

<400> SEQUENCE: 102

taataggact acttctaact tgtaagagca gatccctgga caggcagga atacaggtat 60

tttgtccttg aagtaacctt tcag 84

<210> SEQ ID NO 103

<211> LENGTH: 84

<212> TYPE: DNA

<213> ORGANISM: Homo sapien

<400> SEQUENCE: 103

taataggact acttctaact tgtaagagca gatccctgga caggcaagga atacaggtat 60

tttgtccttg aagtaacctt tcag 84

-continued

<210> SEQ ID NO 104
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien
<400> SEQUENCE: 104
ctcaccatgg gcatattgatt gcagagcagc tocgagtcog tccagagctt cctgcagtc 60
atgatcacog ctgtgggcat cctgaggtc atgtctcgta 100

<210> SEQ ID NO 105
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien
<400> SEQUENCE: 105
ctcaccatgg gcatattgatt gcagagcagc tocgagtcga tccagagctt cctgcagtc 60
atgatcacog ctgtgggcat cctgaggtc atgtctcgta 100

<210> SEQ ID NO 106
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien
<400> SEQUENCE: 106
agcaaggact cctgcagggg ggacagtggg gggccacatg ccaccacta ccggggcagc 60
tggtacctga cgggcatcgt cagctggggc cagggtctgg 100

<210> SEQ ID NO 107
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien
<400> SEQUENCE: 107
agcaaggact cctgcagggg ggacagtggg gggccacatg ccaccacta ccggggcagc 60
tggtacctga cgggcatcgt cagctggggc cagggtctgg 100

<210> SEQ ID NO 108
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien
<400> SEQUENCE: 108
caataactct aatgcagcgg aagatgacct gcccacagtg gagcttcagg gcgtgggtgc 60
ccggggcgctc aacctgcaag gtatgagcat accccccttc 100

<210> SEQ ID NO 109
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien
<400> SEQUENCE: 109
caataactct aatgcagcgg aagatgacct gcccacagtg gagcttcagg gcttgggtgc 60
ccggggcgctc aacctgcaag gtatgagcat accccccttc 100

<210> SEQ ID NO 110
<211> LENGTH: 100

-continued

```

<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 110
ttgaagcttt gggctacgtg gatgaccagc tgttcgtgtt ctatgatcat gagagtcgcc 60
gtgtggagcc ccgaactcca tgggtttcca gtagaatttc 100

<210> SEQ ID NO 111
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 111
ttgaagcttt gggctacgtg gatgaccagc tgttcgtgtt ctatgatgat gagagtcgcc 60
gtgtggagcc ccgaactcca tgggtttcca gtagaatttc 100

<210> SEQ ID NO 112
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 112
ggataacctt ggctgtaccc cctggggaag agcagagata taagtgtccag gtggagcacc 60
caggcctgga tcagccccc cttgtgatct gggagccccc 100

<210> SEQ ID NO 113
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 113
ggataacctt ggctgtaccc cctggggaag agcagagata taagtaccag gtggagcacc 60
caggcctgga tcagccccc cttgtgatct gggagccccc 100

<210> SEQ ID NO 114
<211> LENGTH: 80
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 114
tgaagcactt gaaggagaag gttcttcggt gagccgattt catcatcacg cagcttttct 60
ttgaggctga cacattcttc 80

<210> SEQ ID NO 115
<211> LENGTH: 80
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 115
tgaagcactt gaaggagaag gttcttcggt gagtcgattt catcatcacg cagcttttct 60
ttgaggctga cacattcttc 80

<210> SEQ ID NO 116
<211> LENGTH: 80
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 116

```

-continued

tccagatgaa gctcccagaa tgccagagggc tgctcccccgc gtggcccctg caccagcagc 60

tactacacgc ggggcccctg 80

<210> SEQ ID NO 117

<211> LENGTH: 80

<212> TYPE: DNA

<213> ORGANISM: Homo sapien

<400> SEQUENCE: 117

tccagatgaa gctcccagaa tgccagagggc tgctcccccgc gtggcccctg caccagcagc 60

tactacacgc ggggcccctg 80

<210> SEQ ID NO 118

<211> LENGTH: 48

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: Hair pin structure

<400> SEQUENCE: 118

cagagagtac cctccaacgc tgcctgcctg aaacatgcat gcacgggtt 48

What is claimed is:

1. A high throughput method of determining frequencies of genetic variations, comprising:

selecting a healthy target population and a genetic variation to be assessed;

pooling a plurality of samples of biopolymers obtained from members of the population;

determining or detecting the biopolymer that comprises the variation by mass spectrometry;

obtaining a mass spectrum or a digital representation thereof; and

determining the frequency of the variation in the population.

2. The method of claim 1, wherein:

the variation is selected from the group consisting of an allelic variation, a post-translational modification, a

nucleic modification, a label, a mass modification of a nucleic acid and methylation; and/or

the biopolymer is a nucleic acid, a protein, a polysaccharide, a lipid, a small organic metabolite or intermediate, wherein the concentration of biopolymer of interest is the same in each of the samples; and/or

the frequency is determined by assessing the method comprising determining the area under the peak in the mass spectrum or digital representation thereof corresponding to the mass of the biopolymer comprising the genomic variation.

3. The method of claim 2, wherein the method for determining the frequency is effected by determining the ratio of the signal or the digital representation thereof to the total area of the entire mass spectrum, which is corrected for background.

* * * * *